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JANUARY 1990

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Dvorak

On the Controversial Apple-Microsoft Pact

PostScript Clones

For (Almost) Any Printer

Forms Design

For Every Business

Swaine

On System Secrets

Free Power Booster

For Wingz

DTP Close-Up

THE BIG THREE SHOOT IT OUT

PageMaker

Can the king be dethroned?

Aldus' PageMaker has long been the program against which other DTP publishers measured their own efforts. After all, it was Aldus that coined the term desktop publishing, and PageMaker's metaphor has captured the imagination of publications alike.

QuarkXPress

Need total control?

Of the Big Three page-layout programs, QuarkXPress is the youngest, but it has grown up quickly. From the beginning, QuarkXPress has been a professional designers' program, featuring features that PageMaker only dream about. QuarkXPress' great advantage has been the speed with which it offers users a quality publication.

Ready, Set, Go!

Can Ready keep...

Like PageMaker, Set, Go! was present at the beginning of desktop publishing. It offered real page layout features that other programs didn't have. It was the first to offer a "real" desktop publishing environment. It was the first to offer a "real" desktop publishing environment.



Then again, some same thing about



Nobell Chem Revenue Potential Product Portfolio Breakout

	1989	1990	1991	1992
High Growth Markets				
Medical Applications	15	25	40	60
Industrial Applications	30	39	46	51
Total	45	64	86	111
% of total	55%	63%	68%	72%
Mature Markets				
Defense Applications	36	38	40	42
	45%	37%	32%	28%
% of total	45%	37%	32%	28%
Total Revenue	81	102	126	153



N o b e l l C h e m



Report to the Board of Trustees

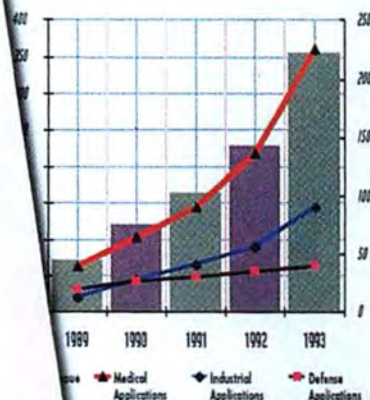
During the past twelve months, the Nobell Chem Corporation pulled far ahead of the competition, through the diverse and strategic marketing of its Nitro Glycerin compound.

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Nobell Chem now become a leading marketer of Nitro Glycerin in pill form, to aid in various medical uses. As a result of this development, Nobell Chem is now expanding its distribution channels.

1989	1990	1991	1992	1993
15	25	40	60	85
30	39	46	51	72
36	38	40	42	44
81	102	126	153	201

Explosive Growth Potential



N o b e l l C h e m

Explosive Growth Potential



people thought the nitro and glycerin.

If you own a Mac® you may already know what a phenomenally powerful piece of software Microsoft® Word is.

Likewise, you may also be aware of how powerful Microsoft Excel is.

Well here's something you probably don't know:

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Because together Word and Microsoft Excel let you exploit the Macintosh's operating system in a way that has never been possible before.

We call this unprecedented feature "warm links." But you'll be more inclined to call it the best thing for revising documents since white out.

Imagine it's the end of the day and tomorrow's the BIG presentation. You've been working with the sales manager to incorporate his Microsoft Excel projections into your report. You're finally done. But wait. Suddenly he makes one of his famous last-minute changes to the spreadsheet.

This is where warm links saves the day (or the hour). No more antiquated manual moves of opening and closing your document, cutting, pasting and praying. With warm links, you simply open your Word document and select Update Link. Word automatically finds the latest Excel data and updates

your report. It's as simple as it sounds.

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As you probably know, Microsoft and the Macintosh have an unusually close relationship. We've been involved with the Mac since the beginning. Which means we know how to get the most out of it, now.

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For a free brochure that describes how you can improve productivity by using Microsoft's Mac applications together, call (800) 541-1261, Dept. K30. And ask about The Microsoft Office—four of Microsoft's best-selling business applications at a great price.

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Paste	⌘V
Clear	
Again	⌘R
Table...	
Glossary...	⌘K
Show ¶	⌘Y
Paste Link	⌘F4
Update Link	⌘F3

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198
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MacUser

StartUp

News 60

EDITED BY RUSSELL ITO

Poof! The Vaporware Hall of Fame salutes products that are either tomorrow's hot technology or today's hot air — not even the venture capitalists know for sure. Plus news, rumors, the hottest new products, upgrades of old favorites, and more.



Bobker's Dozen 62

BY STEVEN BOBKER

Thirteen hot but unheralded products: an indispensable utility for magically retrieving deleted files, a powerful disk

partitioner, a second-generation virus detector/preventer, and ten more.

Pinstripe Picks 69

BY ROBERT R. WIGGINS

The bottom line on business-productivity boosters. Software to (temporarily) turn your Macintosh into a PC clone, create and customize maps, streamline decision making, do forecasting and risk management, and more.



Reviews 74

Computerized Classic Bookkeeping: A complete accounting package powered by Excel. 74

Fontographer 3.0: The premier font toolbox adds power and features. 75

Freedom of Press: PostScript output without a pricey printer. 77

MacRecorder 2.0: Record, edit, compress, and mix digital stereo sounds with your Mac. 81

Smart Art II and III: A new generation of PostScript special effects. 83

Virtual: Run big programs on small machines. 84

JetLink Express and MacPrint: Macintosh output on DOS laser printers. 86

Anatool: The software-engineering data-flow-diagramming tool we've been waiting for. 88

Language Master: 83,000 words to the wise — in a DA. 92



Features

DTP Close-up

Page-Layout Play-offs 104

BY ROBERT VIRKUS

Let's settle the matter once and for all:

QuarkXPress, Ready,Set,Go!, and Page-Maker all claim to be the best, with more support for color, enhanced interfaces,

more features, and improvements in their abilities to work with other tools of the DTP trade. *MacUser* pitted the Big Three page-layout programs against each other to see how they handled production of a four-color publication — from word-processing hooks to style sheets, from gray-scale graphics to four-color separations. Which one's right for the pros?

In Good Form 137

BY BEN TEMPLIN

Sure, Claris' SmartForm, Adobe's TrueForm, and Power Up!'s Fast Forms let you design printed forms. But they also add a new twist that may finally make the paperless office a reality, with built-in database capabilities that make truly interactive electronic forms possible for the first time. We'll show you which program's in top form.

Charting a Course 162

BY SALVATORE PARASCANDOLO

Whether you're organizing a business or writing a subroutine, it helps to develop the big picture graphically. Three smart flowcharting programs — Diagram-Maker, MacFlow 3.0, and TopDown — make it painless.



Power Tools

EDITED BY JAMES BRADBURY
AND KRISTI COALE

Power Scripting with Wingz 218

BY JAMES FINN

Wingz can operate on every selected cell in a spreadsheet but not in the version Informix released. Here's a free program that does it for you.

Integrating the System 225

BY MICHAEL SWAINE

Make your System more of a system. When to use Apple's tools and when not to. And how to *think* like a power Mac user.

Tip Sheet 231

COMPILED BY GREGORY WASSON

Readers send in tips, tricks, and undocumented features for Illustrator 88, Suitcase II, PageMaker, SuperPaint, Canvas 2.0, the LaserWriter, and more.

Help Folder 237

How can you make Times look good on an ImageWriter? When can a hard disk help a LaserWriter? What are the upgrade options for a 512KE? How long before your disks die? Why does printing from PostScript text files work better in theory than in practice?

Desktop Publishing

EDITED BY AILEEN ABERNATHY

Font Woes 245

BY HENRY BORTMAN

Fonts a mess? It's not your fault. Here's a survival guide to dealing with the richness (and chaos) of Macintosh fonts by merging fonts on your menus. Plus an exclusive table of the Adobe-font family tree.



Bridges

EDITED BY HENRY BORTMAN

Eavesdropping with Inter-Poll 257

BY KURT VANDERSLUIS

Is your network on the verge of collapse? Inter-Poll's echo test spots network trouble fast.

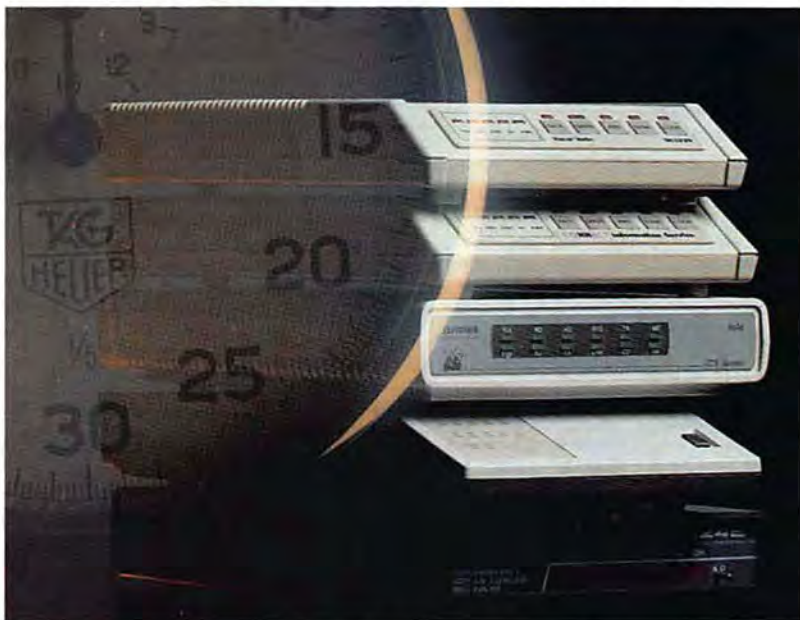
Mac-to-Mainframe Mating 260

BY ERNEST H. MARIETTE

Mainframes make great Mac peripherals. The best ways to get them talking.

MacUser Labs

Superfast Modems



Modems: 9,600 bps and Counting 180

BY GORDON MCCOMB, RIK MYSLEWSKI, AND THE
MACUSER LABS STAFF

Your telecommunications can never be too fast. Now that 9,600-bps modems are becoming both practical and affordable, is it time to invest in the future? MacUser Labs spent 500 hours testing every high-speed modem priced at less than \$1,500. We simulated tough real-world conditions to find the fastest, cleanest, and best buys.

Labs Brief: Modem-Cable Rewiring

..... 213

BY ANDREW EISNER

AND THE

MACUSER LABS STAFF

Telecommunicating at 9,600 bps sounds easy but ... We give you step-by-step instructions to make the connection complete.

Advertiser

Index 276

Marketplace ... 286

Opinion

In Remembrance 5

Letters 8

Readers defend the CrystalPrint printer, question the meaning of FDHD, and proclaim that it's never Ok in a dialog box.

Robert R. Wiggins 17

Better-business-software bureau: How Pinstripes get Picked.

Jim Seymour 23

Four sensational programs for managing and manipulating PostScript typefaces.

John C. Dvorak 302

What's really behind the Apple-Microsoft-Adobe scrap?

Cover Photo Mel Lindstrom

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In Memory of
John J. Anderson
1956 - 1989
and
Derek Van Alstyne
1967 - 1989



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MacUser is always looking for new and unusual products for our StartUp, Power Tools, Bridges, and DTP sections, as well as for feature coverage. If you've got a product that you'd like to tell us about — whether it's new or an upgrade — send your letters or press releases to Michele Stokol, Editorial Assistant, *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Technical Difficulties and Help

Although we can't offer any telephone assistance, *MacUser* welcomes your technical questions. If you've got a Mac question or problem, send it to Help Folder, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. If we can't give you an answer, we'll find someone who can. Because of the volume of mail we receive, we can't answer all your questions, so we also recommend that you take advantage of your local user groups. You can find the one nearest you by calling Apple toll-free at (800) 538-9696, ext. 500.

Tips, Hints, and Programs

We love to get tips and hints (on a disk, please) from our readers. Any tips should be sent to Tip Sheet, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. We can't print every tip, but we try our best to pick the most interesting and representative ones for publication. We'd also like to hear from any programmers who are interested in contributing to our utilities disk series or labs-benchmark disk series. If you're interested, contact Michele Stokol at the address above.

Writing for MacUser

If you have an idea for an article you'd like to write, we'd like to read it. Send a query letter with samples of your writing (published if possible) and some information about your background to Jon Zilber, Executive Editor, *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. No calls please. Since we rarely buy unsolicited manuscripts, save yourself some work and don't send us a completed article without writing first. Please allow four to six weeks for a reply.

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Founding Publisher **Felix Dennis**

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On October 17, 1989, two MacUser editors were among the casualties of the Bay Area earthquake. You may not have known their names, but their contributions were evident throughout these pages. This month, in lieu of our usual commentary from the editor-in-chief, the MacUser editors collectively present this tribute to John J. Anderson and Derek Van Alstyne.

In Remembrance

In 1984, the Macintosh was a puzzle: You had to fill in the missing pieces to read the hidden message. John Anderson got it immediately. He understood that this "insanely great" machine was really just an amplifier for insanely great people, and he set about using it and encouraging others to use it for the highest human purposes. In his writing, in the stacks he developed under the Acme Dot logo, and in his plans for MacUser's Media Labs, he was always on the human side of the human interface.

John "got it" in other ways as well — he always had just the right turn of phrase, the right comeback, the clever summation of whatever you were struggling to articulate. A visit to his office was likely to turn into an exhilarating brainstorming session from which you walked away feeling brilliant, even though most of the ideas were John's.

He could capture a trait in an instant one-liner: "She was a walking game of Pictionary." "He's so in touch with his feelings, he's got call waiting." John always stayed five steps ahead, an insightful observer and appreciator of life who turned everyday happenings into memorable events.



The fullness with which he lived makes our images of him all the more vivid: John at his desk, smoky-brown glasses, neatly cut hair, perfectly clipped mustache, looking like Central Casting's idea of a Damon Runyon bartender. The same scene, a year later: his hair grown out and tied back

JOHN J. ANDERSON, 1956 — 1989

DEREK VAN ALSTYNE, 1967 — 1989

in a ponytail, son Peter perched on his shoulders as he types, bragging about Katie, his and Lauren's one-year-old. In a Boston hotel lobby at 2:30 A.M., wearing a baseball cap and chewing on a stale cigar, in a frenzied search for a 5-meg Mac II for a demo. On the beach, flying six of his kites simultaneously, his back to the wind.

When John became director of MacUser's Media Labs, one of his first decisions was to hire a brilliant and visionary young programmer named Derek Van Alstyne. At a dinner meeting at a Mac expo in Boston, Derek's idealism and enthusiasm struck a chord with John, recalling for him his own enthusiasm the first time he saw a Macintosh.

When Derek studied biotechnology in college, he wasn't satisfied with just growing tissues; he wanted to grow entire organs, to push the frontiers of the new science and create life. When he discovered computers, his ambitions were just as high. He wasn't satisfied with just writing programs; he wanted to create new ways of making information accessible, to push the frontiers of what computers could do for people. One key was an information engine that he was working on. When someone suggested that his dreams wouldn't be practical until computers became as ubiquitous as telephones, he disagreed: The way to achieve the dream was to create the engine now, without waiting for a market to justify it. That vision was what he was working on at MacUser.

Derek was a triathlete, and he had all the dedication and energy his goals demanded. He regularly worked 12- and sometimes 16-hour days. ("Oh yeah," he recently told an editor who was leaving the office before midnight, "you've got one of those 'life' things. I've got to get me one of those 'life' things.") But they weren't all 16-hour workdays. Those closest to him remember a sly sense of humor; a laugh that came naturally and easily; musical tastes that carried his day from Beethoven in the morning to speed metal as the evening wore into night; a smile that encompassed his face; an intelligent, intense, sensitive, caring man.

John and Derek were perfect complements to each other in the work they were doing. They also complemented and enriched our lives. We will miss them. ☹️





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About

MacUser

Baud, bps, and Black Boxes

To most people, modems remain perfect black boxes. Plug a phone line into one socket and a modem cable into the other, and the box works its magic. It's simple, mysterious, and convenient—but it makes it tough to choose a product based on hard facts.

MacUser Labs doesn't believe in black boxes.

When the Labs attacks any subject—whether it's PostScript printers, hard-disk drives, or high-speed modems—it's not enough to leave no stone unturned. Each stone must be turned under systematic, controlled, and reproducible conditions.

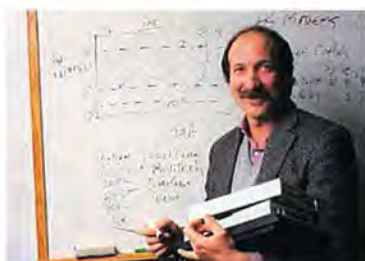
When Labs director Andrew Eisner and the MacUser Labs staff tackled high-speed modems, they knew they had to do more than plug in 11 black boxes and press the On switch. The V.32 modem standard represents a white-hot emerging technology—one that may or may not prove economical for present users. "We wanted to demystify and explain a technology that's only now becoming affordable and practical," says Andrew (all the modems tested were within a range of \$800 to \$1,500). "Only then can we roll out the benchmarks." To get a handle on those benchmarks, Andrew relied on nearly 20 years of experience with telecommunications, dating back to when a Teletype with a 300-baud acoustic coupler was considered the state of the art.

The state of the art has come a long way since then, so the Labs set up the same kind of telephone-line simulation equipment that modem manufacturers buy. It's expensive, but the manufacturers understand—that it's the only way to know how a modem will perform under a wide range of conditions. During 500 hours of testing, each modem revealed strengths and weaknesses, which the Labs meticulously recorded. The final result is this month's report: "Modems: 9,600 bps and Counting."

MacUser Labs' reports contain plenty of information, and not all of it relates directly to the product benchmarks. This month, for instance, you can find out what makes a modem tick ("How It Works"), what to expect from this technology in the near future ("On the Horizon"), and even how to tell the difference between baud and bps ("Same Highway, More Traffic").

Often, what the Labs learns spills out beyond the report. This month, for instance, Andrew discovered that standard Mac modem cables don't support the hardware handshaking that's essential for superspeed telecommunications. He wrote "Modem-Cable Rewiring" as a special Labs Brief to provide instructions on how to make an inexpensive jumper cable that solves the problem.

The data collected by MacUser Labs appears not only in its own reports and briefs but also in individual product reviews. It takes time, money, and sweat, but we think it's worth it. Because when it comes to hardware, software, or black boxes, you shouldn't have to judge the winner by its cover.



MacUser Labs' Andrew Eisner

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Canvas

When we offered MacDraw II[®] users the chance to trade up to Canvas[™], we had no idea what we were letting ourselves in for.

We've been buried in an avalanche of MacDraw II disks. Swamped. Inundated. Overwhelmed. The fact is, we've received thousands of disks, with more arriving daily.

If you've read the reviews, you shouldn't be at all surprised.

In awarding us 5 mice (versus 3½ for MacDraw II), *MacUser* (April, 1989) called attention to many of Canvas' unique features, including much higher precision, a 16.7 million-color wheel (vs. only the basic 8 for MacDraw), full Bezier curves and auto-tracing of bit maps.

MacWeek (January, 1989) was no less enthusiastic. "Canvas 2.0 is loaded with drawing tools and tool enhancers that go beyond those of its more expensive object-oriented rival, MacDraw II ... Canvas is superior in color handling, the

comprehensiveness of its drawing environment, support for a variety of file formats and its neat object library feature."

MacWeek went on: "Canvas can position objects extremely accurately - down to one sixty-four-thousandth of an inch ... a boon to technical illustrators and others with low-range drafting needs."

And all this was *before* we introduced such additional enhancements as 4-color separation capability, dashed lines and even a spelling checker.

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Dr. Tom Hertig of Ridgewood, New Jersey, likes the new format we inaugurated when we converted to desktop production. He writes that it's "clearer, very informative, and best of all gives tips, help, and data (as in September's lab report on PostScript printers). I applaud your efforts to make the magazine as useful as my Mac." We may never be as useful as your Mac, Tom, but we hope that's because we've made your Mac more useful.

COMPILED BY JAMES BRADBURY



House.



Senate.

We found a measure they could both agree on.

Up on the hill it looked like another split along party lines. Both Macintosh and PC users fought for access to the same information. Until a TOPS network brought them together in bipartisan agreement, that is.

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- TOPS supports AppleTalk and FlashTalk running on twisted-pair cabling (telephone wire), and EtherTalk on thick or thin Ethernet cabling.
- All IBM PCs, PS/2 Models 25 or 30, or compatibles require TOPS FlashCard, 3Com EtherLink II or Western Digital EtherCard Plus. PS/2 Models 50 through 80, or compatibles require 3Com EtherLink/MC card.
- TOPS can be configured as a distributed, dedicated, or combination server network.

Maybe that's why TOPS has been voted the de facto standard for easy Mac-to-PC connectivity by some 600,000 users. All you have to do is install TOPS software in each Macintosh and PC on the network, add a network card to each PC, and you've got a quorum.

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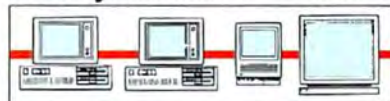
And if you're looking to discuss the issues with other networks and systems, such as Novell, AppleShare, and Sun NFS, TOPS provides the perfect forum.

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the review was written didn't work properly. Even with version 1.02, XTreeMac and networks are a bad mix—a fact that should be displayed prominently either on the box or in the documentation.

— DJR

Mousing Around

I read "Building a Better Mouse" (October '89) with considerable interest. I recently discovered that my Mac sometimes boots up in a manner that lets me simultaneously use my regular mouse and my trackball, which I find to be a considerable advantage.

Interestingly, the manufacturer of the trackball assured me that such combined operation was impossible. Fortunately, one of its engineers was able to restart his Mac and obtain exactly the "impossible" condition I described. I just wish I could count on that dual capability every time I started up. For now, I'm just not shutting down.

J.E. McCutchen
Parsippany, NJ

Why Johnny Can Read

John Dvorak's columns are occasionally trivial but rarely ludicrous. He apparently dislikes multimedia as a teaching tool because such systems are based on one person's "predistilled" viewpoint. He considers multimedia a dangerous "propaganda tool" for this reason. What I want to know is the names of the schools Dvorak attended. Obviously, all his teachers were completely unbiased and open-minded.

Kim Baker
Mesa, AZ

City Limits

Your June '89 Scrapbook article on SimCity stated that Maxis is planning to



Special Delivery...

■ ■ ■ Although Apple Computer hasn't made up its mind about a low-priced Macintosh, our readers have plenty of suggestions. One of the more unusual ideas comes from William H. Clarke of Missoula, Montana, who must have had the runaway success of Mazda's Miata in mind when he suggested a new model with classic styling and an open top: "Why doesn't Apple bring out an 'SEc' — an SE chassis without the screen? The SE chassis is a natural for the adaptation. They'd be reasonably priced (at least they *could* be), they'd sell like hotcakes, and you'd overcome the dislike that many people have for the Macintosh's small screen."

Meanwhile, mail's still pouring in regarding Apple's authorized dealer network. "It doesn't work worth a hoot," writes Ronald P. Andring of Walla Walla, Washington — and his is one of the kinder, gentler assessments. He goes on to wonder if Apple knows "how many disappointed Apple owners are out there? I don't think so, because the company actively discourages us from writing to them."

While the treatment from dealers seems unwarranted, 90-day Apple warranties still strike many as a sour deal. Gilbert Pierce of

Memphis, Tennessee, was "unfortunately one of those who experienced a failure on a four-month-old Ilcx hard disk. Apple will repair the drive, but I can buy the exact same drive with a five-year warranty from an aftermarket supplier for less than what Apple wants to exchange the four-month-old drive for. So much for benefiting the consumer."

Speak Up:

With the introduction of Apple's new machines — such as the Ilcx, Ilci, and the Mac Portable — the typical cost of a complete Macintosh system for business is now often in the five-digit range. On the DOS side, Compaq Computer has successfully challenged IBM by providing more bang for the buck; perhaps the time is ripe for a similar upset in the Mac universe.

How important is the Apple label when you choose Macintosh computers and peripherals?

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June 1989 ★★★★★

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MAC USER

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KING STRATEGY



Page 1

KING

S T R A T E G Y

To some it was just a game, an intricate game composed of moves, sublime suggestion, intricate defenses. To him, it was a paradigm of life. An ever repeating pattern. Of Victory and Defeat. A game unique. Each game a sweet experience. He studied Strategy. He read Clausewitz. He examined Napoleon. He marvelled at the Masters. He never stopped learning. He played his opponent as close as some would hold a lover. He played the clock as if his life depended on hitting the button five seconds before the allotted time. They called him the King of Strategy. He called himself a Student of Life.



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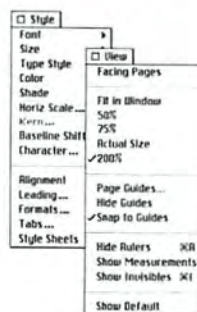
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remove copy protection on future versions of SimCity. I recently called Maxis and was told this: "MacUser is out to lunch. Maybe we'll remove the copy protection someday, but for now we are interested in sales."

As a rule, I don't purchase copy-protected software. And definitely not software from people with an attitude such as this. The person I spoke with at Maxis continued to state that SimCity was not a game but a simulation. Sorry if you hadn't

heard, but business software and simulations don't require people to insert key disks anymore.

**K. C. Cowan
McMurray, PA**

Maxis originally intended to keep SimCity copy-protected until the program was well established in the marketplace. The program's success in the education market was probably as much a surprise to its publisher as to anyone else. Maxis told us last March that SimCity was designed for those who were "bored with other Mac games." — KC

Desktop Spelling

Your reviewer skipped the greatest plus of all in his review of Thunder II (StartUp, October '89). It can be used as a spelling checker for PageMaker files. That feature will keep a lot of DTP users from switching to QuarkXPress.

**Nancy K. Molitor
Sacramento, CA**

Caveat emptor: Only version 1.01 of Thunder II has the "PageMaker-compatibility module" that allows it to batch-check PageMaker files. — JB

OK Quarrel

Please encourage programmers and software publishers to conform to a single convention regarding the "Okay/Cancel" buttons in dialog boxes. The correct form is *OK* (both letters uppercase), not *Ok*, which always looks like zero kilobytes, which is scary enough anyway!

**Tod Wicks
Palo Alto, CA**

Pictures Imperfect

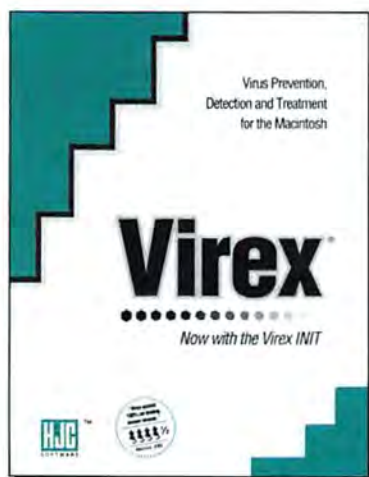
I don't like the cute little pictures of yourselves at the beginning of each article. I hope it's a late '80s fad. I like making up my own mental image of what you people look like. God didn't put a picture of Himself in the Bible, so why do you put your pictures in the mag?

**Andrew M. Chisholm
Lincoln, NE**

Actually, it's an early '90s fad. Although God didn't include a picture, just think how many arguments it would have settled if She had. — JB

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MacUser Magazine, October 1989

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ROBERT R. WIGGINS



If you've been reading *MacUser* for some time, you've probably noticed some changes, both major and minor, going on in these pages over the past several issues. Whole sections of the magazine are moving about and changing their names. *MacUser* has plunged completely into desktop publishing. Layouts and designs are changing, and the art department has been working overtime (and to good effect too, if you ask me). Editor-in-chief Paul Somerson and art director Lisa Orsini are the chief architects behind most of these changes, and I think they've done a great job of keeping *MacUser* vibrant. I hope you agree with me.

This column is not immune to the changes sweeping the

you on the road. Data-analysis software. Economics and stock-market analysis. Forms design and use. Graphics: business charting and other business-graphics applications. Hardware (occasionally). Image processing and film recorders. Job management. Knowledge bases and CD-ROMs. Laptop software.

Picking Pinstripe Picks

magazine. You may have noticed that the name Pinstripe Mac dropped off a few issues back. In this issue, an even more substantial change takes effect. For nearly three years, this column has been the home of Pinstripe Picks, a collection of minireviews designed to draw your attention to business-oriented products that you might otherwise overlook. Pinstripe Picks never had any pretense of being full-fledged reviews; they were intended as pointers that would enable you to determine whether you were interested enough in a product to look it up elsewhere in the magazine.

Over the past year, though, a disturbing trend developed: The Macintosh software market exploded with so many new products that some slipped through the cracks and never got formally reviewed. Business products selected as Pinstripe Picks might never get mentioned anywhere else in the magazine — making it impossible for readers to follow up and get more information.

Beginning with this issue, Pinstripe Picks has moved to *MacUser's* StartUp section, tucked in with the other reviews. It's been expanded too. It still consists of concise reviews, but they're a little longer now, with more-specific information; they even have mouse ratings. The focus of Pinstripe Picks has also shifted slightly. Previously, I emphasized major products that were covered fairly well elsewhere and mentioned some smaller products as well — but all were products I wanted to make sure you knew about. With the greater business orientation of the "new" *MacUser*, major business-oriented products are going to be getting even more coverage. So now Pinstripe Picks will concentrate primarily on smaller products from smaller companies that might not receive coverage otherwise. That includes vertical applications, add-on products, and even an occasional book. And there will still be some picks of major products to let you know they're covered elsewhere. One important criterion will remain in effect, though: They'll all be products that you may be interested in if you use your Macintosh in business.

Mail systems. Niche products. Operations-research packages. Project management. Quick-and-dirty utilities. Revised and updated products. Security systems. Time-management software. Upgrades. Vertical-market software. Worksheets. Xpert systems (I apologize, but X is hard). Your old favorites. Zero-based budgeting systems.

You might wonder how I decide what products to pick. The hard part is just locating all the possible products to look at. I get lots of help from the *MacUser* staff, and I also do many of the same things you do to keep up with the ever-changing market.

I attend trade shows such as the Macworld Expos in San Francisco and Boston and Comdex in Las Vegas, scouring the aisles for new packages.

I read the industry press, although, like some of you, I recently had my subscription to *MacWEEK* canceled without warning when they increased their requirements for a free subscription. If you're like me and no longer (or never did) qualify for a free subscription, *MacWEEK* does sell paid subscriptions for \$75 a year. If you want to stay really current, it's a good investment. You don't have to keep requalifying, either: just send them a check every year, which is much easier

You might wonder how I decide what products to pick. The hard part is just locating all the possible products to look at. I get a lot of help from the *MacUser* staff.



BY ROBERT R. WIGGINS

PHOTO FINISH.

ThunderScan is making page-one news with Macintosh owners. That's because it's the least expensive gray scale scanner available and it's also quite powerful.

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than answering all those questions. (Think of this as the last PinStripe Pick in this column.)

Once the products have been located, I sort through them to find the ones I think you should know about. Some products are eliminated because they're just not good enough. Products that would earn only a one- or two-mouse rating are discarded. Some products turn out not to be business-oriented. These get sent on to Steve

Once the products have been located, I sort through them to find the ones I think you should know about. Some products are eliminated because they're just not good enough.

Bobker, whose Bobker's Dozen reviews also appear in the StartUp section of the magazine. New versions of existing products are not considered for review unless they include major changes or improvements. The products that survive this winnowing get a more thorough examination and go into the PinStripe Pick Possibles file.

Once a month, I dip into the Possibles file and pull out the top products that I think will interest the greatest number of readers. If a major business product that has been reviewed elsewhere in the magazine deserves a special mention to draw it to your attention, that product will get a special PinStripe Pick (without a mouse rating). And that's how PinStripe Picks are selected.

So while it may seem like a lot of things have changed at MacUser, the changes in this column are actually pretty small. I'll still be giving you my opinions on issues that relate to the Macintosh and the business world, and I'll still be making PinStripe Picks to keep you aware of business-oriented products. You'll just have to look in two places in the magazine to find me. 

WIGGINS

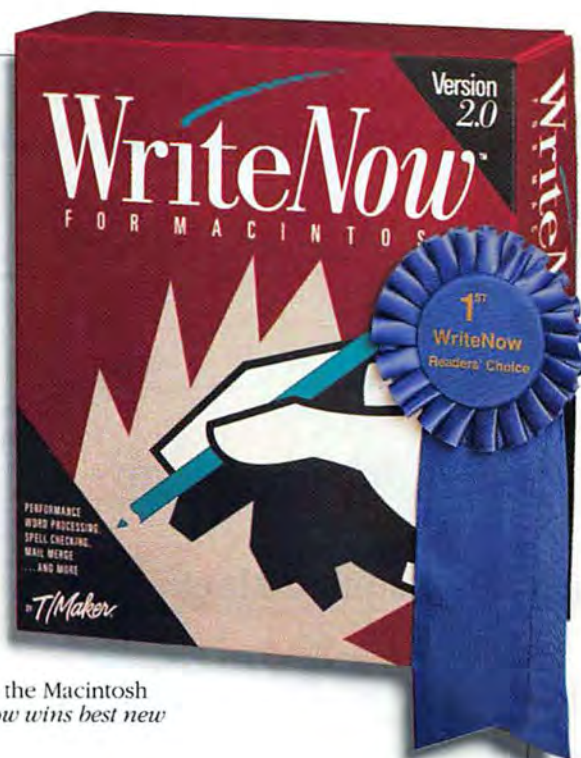
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MacUser Magazine, May 1989

"Readers' Choice"
MACazine, January 1989

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MacGuide, Winter 1988



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An obvious use for The Art Importer is to put product and corporate logos into an "alphabet" so they can be inserted with a keystroke rather than having to be imported as graphics files and then scaled to fit. I've put other odd little graphics into Art Importer fonts, such as end-of-story marks, or "end signs" — such as the Mac-style cursor arrow clicking in a Close box found at the end of every *MacUser* story.

You don't have to drop these characters into text, of course. The Art Importer can serve as a kind of one-keystroke macro program to insert art, which you can then scale to whatever size you wish. For example, I've digitized signatures, auto-traced them into FreeHand, saved them as EPSF files, and then converted them to PostScript characters with The Art Importer. Now I can drop those signatures into forms quickly and easily.

My second fave is Smart Art (reviewed in October '89), a \$149.95 DA from Emerald City Software (Menlo Park, California; [415] 324-8080). It lets you apply the magic of PostScript manipulation to standard fonts — including the famous Adobe "hinted and locked" fonts.

Type-Tools Trilogy

On IBM PCs and clones, manipulating type usually means such exciting things as changing a word to boldface or italic — or maybe, in a burst of creativity, using large and small capital letters in the same word. Mac users, of course, are accustomed to far more attractive documents and to far superior tools for building those documents — tools that are commonplace in the Mac universe. Among these are "real" typefaces with a typeset look.

I'm going to wrap up this series of columns on new typefaces and type-related programs that began in October '89 with a look at three sensational programs for managing and manipulating PostScript typefaces on the Mac and a note on a utility you probably already have.

The Art Importer, a \$179.95 wonder from Altsys (Plano, Texas; [214] 424-4888), is like a keyboard-macro program for custom PostScript-type characters. The Art Importer was initially called KeyMaster, under which name you may have seen it advertised (and reviewed in July '89). A conflict over that name led to the change.

Forget the name: The Art Importer is one useful program. You create your own letterforms, symbols, logos — whatever — in either Illustrator 88 or FreeHand as EPSF files or in MacDraw as PICT files and then read them into The Art Importer. There they're transformed into PostScript-font characters, which you can then insert into any document from the keyboard as you type.

That's right — The Art Importer creates "alphabets" of your own devising. Each character in those alphabets is a graphical symbol that you can insert into documents at the touch of a key and then select, scale, rotate, or treat as you would any other PostScript-font character. The Art Importer creates matching bit-mapped screen fonts too, so you can see on-screen what you're doing.

Smart Art gives you a choice of 15 kinds of type manipulation, including simple rotations, curved text, drop-shadow and mirrored-shadow text, "movie title"-style receding text, and the ability to print characters in a screen of any density percentage.

You pick the effect you want and specify the text, font, size, and other specs. Smart Art then writes and sends to your LaserWriter the PostScript code to achieve that effect — and tells the printer not to print the result but instead to send it to your Mac, where it's displayed on-screen. Every change requires a reimagining round-trip to the LaserWriter, but the benefits are worth the wait.

Some of Smart Art's effects are a bit far out, but just its ability to print text in a screened pattern, rather than solid black, can liven up your documents.

FontSizer II, a \$99.95 package from Specialty Software (Austin, Texas; [512] 327-8608), is the third item in this tool kit. It creates precise bit-mapped screen fonts that give you high legibility, not a mass of jaggies, when you're working with large or unusual sizes of fonts on-screen. (An earlier version was reviewed in April '89.) FontSizer also uses the LaserWriter's computer to create these images and ship them back to the Mac.

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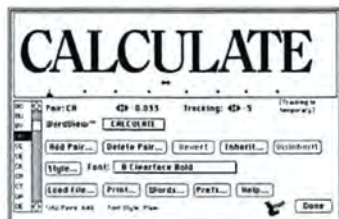


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It's time-consuming to create, say, a bit-mapped screen font of 92-point Eras Ultra, and the resulting bit maps take up a lot of hard-disk space. But if you like to use 11-point type for correspondence or 67-point Antique Olive for the header in a stationery form — and you're tired of looking at an ugly screen — FontSizer II is the answer.

Finally, here's an extra type-management utility you probably already own. One of the joys of Mac applications running in tandem with PostScript printers is that those applications automatically download the fonts you've specified for each document. It's painless . . . and endless.

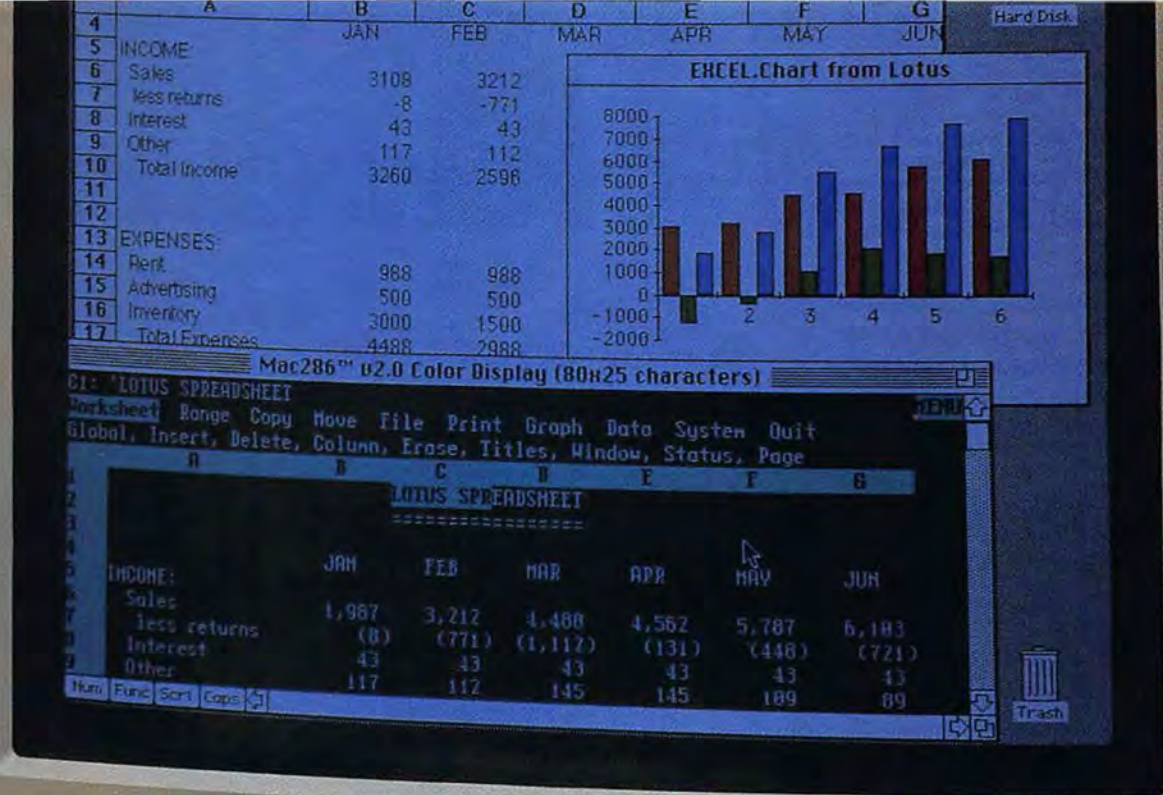
For example, waiting for PageMaker to send the seven fonts you've used in your four-page brochure to your LaserWriter is tedious enough. But worse by far is what happens when you're *designing* that printed piece.

If you work the same way most designers do, you use the laser printer for many interim proofing jobs, to see how a typeface works. Because these auto-downloaded fonts are handled by the LaserWriter as temporary fonts, they're flushed from the printer's memory after every print job. So, if you repeatedly print sample pages while you're developing a design, you have to wait while the whole font set is downloaded — again and again and again.

There's an easy way around that. Once you think you know the fonts you'll be using, Adobe's Font Downloader utility, which comes free with every Adobe font package, can download those fonts to the printer as "permanent" fonts. It's easy (if not especially quick), and you'll save an enormous amount of time when you print sample pages.

When you send those pages to the printer, make sure you remember to tell your application program not to download the fonts. In PageMaker, for example, hold down the Option key while you click on the OK button in the Print dialog box, and then click the Download PostScript Fonts box off.

Together with the programs I discussed last month, these three packages and one bundled utility program make up a powerful tool kit that can save you time and deliver better typographical results on your Mac. ☐



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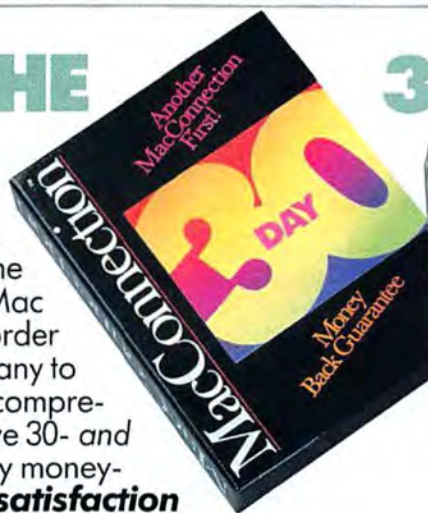
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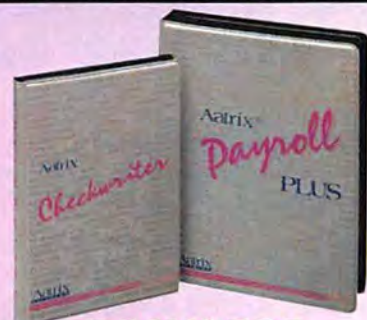
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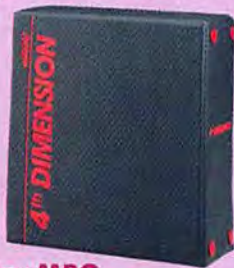
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5572 FoxBASE II/Mac 2.0 \$295.

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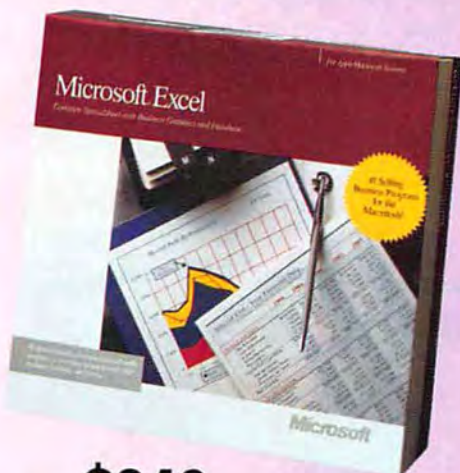
4844 FoxBASE + /Multi-User 2.0 . . 399.

5579 FoxBASE + /Multi-User
 Runtime 295.

No Credit Card Charge Til We Ship.

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The new way to Excel.



\$249

Version 2.2 of **Microsoft Excel** gives you full access to the 8 megabytes in high-powered Macs. That's room enough for remarkably large spreadsheets (and their graphics), documenting your company's financial condition for the past two centuries, and projecting into the next one (which is just around the corner). And, thanks to advanced intelligent recalc, your calculations will be 40% faster. This new Excel is also a visual delight: it lets you select up to 256 fonts per sheet, including up to six styles and eight colors, change row height, add shading, insert notes, and otherwise turn some rather ordinary numbers into some rather extraordinarily compelling visuals. And remember, all these features have been added to what was already the best selling spreadsheet for the Mac. Which could put a smile on the face of the most taciturn number cruncher.

Microsoft ... **30 day MBG**
2865 Excel 2.2 \$249.

The singular solution for any business.

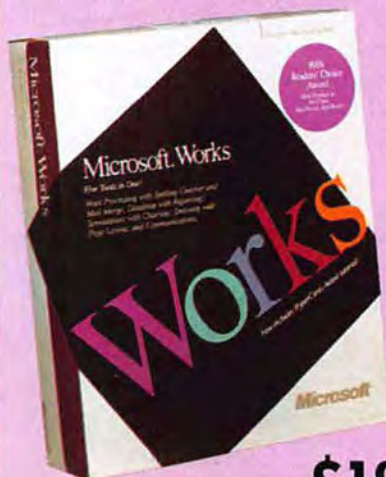
Wait! We take it back! Don't buy Excel! Buy **The Microsoft Office**. It's the budget-balancing way to buy all the Microsoft programs your office needs. It includes Excel, Word, PowerPoint, and Mail in a bundle that's priced significantly lower than all four combined. You'll be working with four full-powered and totally integrated applications, thereby transforming your very own office into a lean mean productivity machine. Look out!

Microsoft ... **30 day MBG**
5454 The Microsoft Office (includes
Excel, Word, PowerPoint, and
Mail) special \$499.



\$499

The singular solution for small business.



\$185

Okay, so you're sitting there thinking that all this power is impressive, but what you really need is one straightforward way to crunch some numbers, manage some lists, write some presentable proposals, and get on-line once in a while. Sounds like you need **Microsoft Works**—it gives you all the tools you need to run a small business or even a rather complex personal life, by combining word processing, spreadsheet, database, drawing, and communications into one powerfully integrated program. So you can keep track of your clients, create newsletters, do your projections, and log on to on-line services, all by learning just one program. Plus, the new drawing module (with page layout) lets you add pizzazz to all of the above. Works also comes with an animated training program written in familiar HyperCard format, and if you ever get confused, you can take advantage of on-line help and unlimited phone support.

Microsoft ... **30 day MBG**
2884 Works 2.0 \$185.

Call 1-800/334-4444 to order.

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Fast C.A.T.

C.A.T. is the lightning-fast relational database that's perfect for managing all your contacts, facts, figures, events, and projects. Plus, it gives you letter writing and mail merge capabilities you need to stay current with all these Contacts and Activities in a Time-ly manner. Enter and look for information based on a contact person, activity (meeting, letter, phone call, etc.), and/or when it happened. It will constantly update your files, and generate reminders, schedules, memos, etc.



\$229

Chang Labs ... **60 day MBG**
1611 C.A.T. 2.0 \$229.

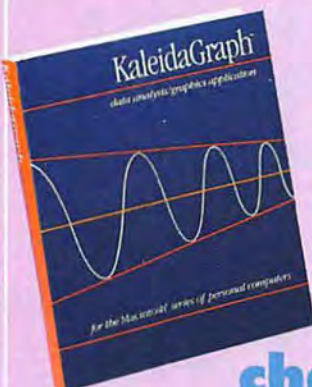


\$95

Hot dates.

Throw away those calendars with their crossed-out plans and multiple layers of stick-em notes. **Endeavour Planner** lets you plan and track projects via a very clean, simple, and fully graphical interface. You work directly with a Gantt chart to enter data, set dependencies between tasks, milestones, and task durations. Every time there's a change, the program automatically updates your new schedules and displays them right on screen.

Softstream Int'l. ... **60 day MBG**
5439 Endeavour Planner 1.0. . . . \$95.



\$145

Top of the charts.

This Mac power tool lets you import data, analyze it, and generate scientific and business graphics. **KaleidaGraph** is extremely fast, and features built-in graphing tools, curve-fitting functions, and user-defined macros. It has 14 types of graphical structures, lets you transform data mathematically, and create high resolution output. Pull-down and pop-up menus make selections and modifications fast and straightforward.

Synergy ... **30 day MBG**
3129 KaleidaGraph 2.0 \$145.

Statistical winners.

With **StatView SE + Graphics** or **StatView II**, you can perform sophisticated statistical analyses and present the results—all in one package! In addition to a wide array of statistical functions, StatView produces ten different types of graphs that are easily customized within the program. It's the only statistics software to be awarded 5 Mice by MacUser.



Abacus Concepts ... **60 day MBG**
4482 StatView SE+ Graphics special 179.
4481 StatView II 1.03 special 249.

Database omnibus.

Omnis 5 is a comprehensive program for developing business data management applications. This multi-user, multi-platform database for the Mac also features SQL connectivity to a VAX or mainframe. It supports full color graphics for "Mac-like" applications, and its HyperCard access allows stacks to read and write to Omnis 5 data files in both single-user and multi-user installations.

\$349



Blyth Software
5492 Omnis 5 \$349.
5855 Omnis 5
(each additional user) 75.

MODEL WINNERS.

From the developers of award-winning StatView statistical software comes **SuperANOVA**, a revolutionary new full-featured general linear modelling program designed specifically for the Macintosh. Ideal for researchers and engineers, SuperANOVA lets you easily perform ANOVA, ANCOVA, MANOVA, MANCOVA, and regression on your data.

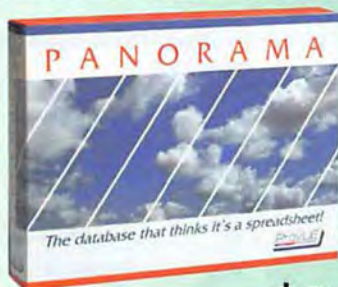
\$439



Abacus Concepts ... **60 day MBG**
5840 SuperANOVA 1.0
(for Mac Plus/SE). special \$439.
5904 SuperANOVA 1.0
(for Mac II) special 439.
5906 StatView SE+ Graphics/
SuperANOVA bundle 595.
5907 StatView II/SuperANOVA
bundle 695.

30/60 Day Money-Back Guarantee.

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POWER IN THE FLATS.

\$199

Just because all you need is a flat-file database doesn't mean that all you can do is manage and sort lists. **Panorama** gives you extensive spreadsheet-like, semi-relational analysis features for finding what that data's trying to tell you. Fast? Its *Clairvoyance* feature will complete common entries for you, and you can easily record your own macros. It also features extensive mail merge, outline capabilities, and a full palette of form design tools.

ProVUE ... **60 day MBG**
4582 Panorama 1.1.1 \$199.

SUPER TOOLS.

SuperCard, a HyperCard-compatible "software toolkit," lets you create simple stacks, full-color multimedia presentations, and standalone applications. It provides color Paint and Draw, animation, custom menus, full-screen windows, and the ability to open multiple stacks. **SuperPaint** combines Paint and Draw capabilities in one program. It features *AutoTrace* to convert Paint graphics into Draw objects, an Airbrush, and a Free-hand tool to sketch Bezier curves.



\$125

Silicon Beach ... **60 day MBG**
3506 SuperPaint 2.0 \$125.
5100 SuperCard 1.0 125.

\$49

3D CLIP ART.



Add another dimension to your favorite desktop publishing, presentation, illustration, painting, and drawing programs with images from these eight great 3D clip-art packages. You can also produce camera-ready art from these high-quality images using laser, thermal, and inkjet printers, film recorders, and a wide variety of dot matrix printers.

Enabling Technologies Special Prices
30 day MBG

5019 Clips 3D Accents \$49.
5026 Clips 3D Business 49.
5020 Clips 3D Fonts 49.
5022 Clips 3D Geography 49.
5027 Clips 3D Lifestyle 49.
5023 Clips 3D Messages 49.
5024 Clips 3D People 49.
5025 Clips 3D Recreation 49.

ENTER THE 3RD DIMENSION.

Add another dimension to your product designs, scientific modelling, animation, and illustrations. **Swivel 3D** lets you bring in existing graphics in virtually any format (Encapsulated PostScript, PICT, PICT2, MacPaint, etc.) and change the lighting, add shadows, or create a 3D background. Or you can start from scratch to build models with parts that twist, turn, swivel, and move in other realistic ways. For animation, put your images into *VideoWorks* or *HyperCard* stacks and watch them come alive.



\$299

Paracomp
4597 Swivel 3D 1.1 \$299.

DREAM IT. DRAW IT.



\$249

IDD, creator of **MacDraft**, now also offers a powerful precision drawing program for professional scaled drawings, illustrations, presentations, and graphics. **Dreams** features zoom, rotation, layers, dimensioning, symbol libraries, an array of drawing tools, and many advanced illustration tools. You can merge shapes together, cut edges of objects using other objects as templates...even glue lines and curves together to form unique shapes to be filled with colors or patterns. If you can dream it, you can draw it.

Innovative Data Design
4707 Dreams 1.0.... special \$249.

PRECISION DRAWING.



\$135

Enter the world of precision drawing and drafting with the two-time *Macworld World Class* award-winning program, **MacDraft**. Its precise, fast, and easy-to-use drawing tools are ideal for creating custom graphics, business charts, forms, illustrations, technical drawings, and schematic designs. You can draw both geometric and freehand shapes, and then rotate, zoom, scale, fill with custom patterns, dimension, or even calculate their area.

Innovative Data Design
2417 MacDraft 1.2B .. special \$135.

Call 1-800/334-4444 to order.

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Fountain of fonts.

\$89
EACH



You can answer all your typeface needs with **MacFontware Typeface Packages**, no matter what Mac output device you use, including: Apple LaserWriter IINT and IINTX, the LaserWriter IISC, and any ImageWriter. The fonts in each package are scalable to any size (within application or device limitations) by PostScript PDL devices. They also provide bitmap fonts for QuickDraw printers, and true WYSIWYG fonts in 20 sizes from 9 to 96 point on your screen. So it's easy to proof type accurately in bitmap format before outputting to a laser printer or typesetter. The two Headline font packages include four typefaces each, and the text faces come complete with roman,

italic, bold, and bold italic. MacFontware fonts are compatible with virtually all Mac applications.

Bitstream

5968 Baskerville	89.
5969 Bitstream Charter	89.
5970 Futura Medium	89.
5973 ITC Galliard	89.
5974 ITC Garamond	89.
5975 ITC Souvenir	89.
5976 Letter Gothic	89.
5977 News Gothic	89.
5971 Headlines I (Bitstream Cooper Black, Broadway, Cloister Black, University Roman)	89.
5972 Headlines II (Brush Script, Blippo Black, Hobo, Windsor)	89.

MULTILINGUAL FONTS.



春花秋月何時了，何事知多少
 拜啓 お客様各位 皆様に御提

Linguist's Software ... 60 day MBG

2636 Kanji, 2631 Hebrew, 2637 Korean, 5759 LaserArabic & Farsi, 2627 Cyrillic, 2630 Greek special each \$49.
 2625 Chinese, 2641 LaserHebrew, 2640 LaserGreek, 2639 LaserFrench/German/Spanish . . . special each 69.
 2647 Greek, Hebrew & Phonetics, 2642 LaserKorean. . . special each 79.
 2638 LaserCyrillic (includes Russian, Ukrainian, Serbian) special 99.

INFINITE PAINT POSSIBILITIES.

NuPaint is an innovative paint program that provides over 100 defined patterns plus 32 x 32 fill-pattern capability. Edit and print up to 300 dpi. It features many unique tools. You can use masking tape to protect areas from drips and splatters, restore small edited areas back to the original, create shadows from any direction, repeat images with precision, free rotate, adjust frame height and width up to 16 x 16 dots, halftone, smooth, stir, fade, mix, and more.



\$79

Good Software ... 30 day MBG
 5428 NuPaint 1.0.4 special \$79.

\$99



GRAPHIC CHARTING SOLUTION.

Now there's a charting package with the flexibility and power to create captivating charts and dramatic graphics, all in one program. **DeltaGraph** lets you choose from 22 3D and 2D chart types with full color support, Postscript output, and complete formatting control over each element in the charting window. Drawing Tools include Bezier curves, lines, arcs, arrows, and special fills. You can also import data from all popular file formats and establish direct links to Excel 2.2 files.

DeltaPoint
 6095 DeltaGraph \$99.

SIMPLY BRILLIANT.

With Pantone Color Selection, a built-in color separator, complete range of paint tools, and sophisticated blending of any 256 colors (out of 16.8 million), **PixelPaint** delivers the most sophisticated paint effects possible in an 8-bit program. **PixelPaint Professional** adds support for 8, 16, 24, or 32-bit color depths (including Apple's QuickDraw 32), 0-100% transparency control, and image processing effects. Both are simply brilliant.



SuperMac Software

60 day MBG
 3380 PixelPaint 2.0 \$225.
 5625 PixelPaint Professional 1.0 . . . 395.

No Freight on Backorders.

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Very decent exposure.

Give yourself total creative screen control with **Exposure**, the System 6.0- and Multi-Finder-compatible CDEV screen graphics utility with screen capture, painting tools and fonts, and the ability to format color and gray scale images. To keep track of all those graphics (and text) try **DAbase**, the full-featured desk-accessory database that MacWEEK called "one of those rare products we can recommend to all regular Mac users."



Preferred Publishers ... 30 day MBG
5751 Exposure 1.1 \$54.
4780 DAbase 1.12 69.

GIVE YOUR INTERFACE CHARACTER.

\$229



Are your applications long on power but short on personality? Give them their very own talking on-screen character (agent) with **interFACE**. This sophisti-

cated animation toolkit lets you develop full-color talking agents of various sizes and proportions (each with up to 120 total images). These agents are an excellent interface for business presentations, training programs, informational kiosks, and more. And, **interFACE** allows for the importation of color into HyperCard.

Bright Star Technology
6093 **interFACE** 1.0 ... special \$229.

CLIP-ART MAPS.



Add a new dimension to your proposals, periodicals, and presentations with **MacAtlas**. You get detailed clip-art maps of the entire world, world regions by country, USA by state, and all 50 states by county. **MacAtlas** maps are ready to customize with fill patterns, drop shadows, text, and more. Available in Paint, Draw (PICT), and Illustrator/Freehand (EPSF) format. Macworld gives it five stars.

MicroMaps ... 30 day MBG
5516 **MacAtlas** (MacPaint) 2.0 .. \$45.
5514 **MacAtlas** EPSF
(PostScript) 1.0 105.
5513 **MacAtlas** Professional
(PICT) 1.0 105.



\$65

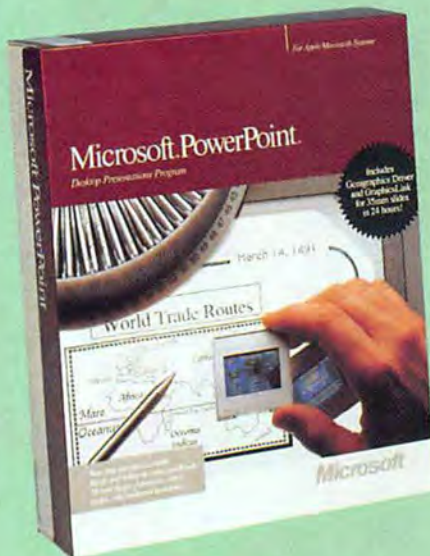
Edit graphics. Anytime. Anywhere.

DeskPaint (with **DeskDraw**) gives you full graphic editing power from within any application. It can create, load, edit, or save any TIFF, MacPaint, or PICT image up to 4000 dots per inch. You get a complete set of bitmap graphic tools including AutoTrace, air brush, smoothing, scaling, halftone control, and special effects. Plus there's support for full laserWriter resolution and huge poster-size printing on an ImageWriter.

Zedcor ... 60 day MBG
3986 **DeskPaint** & **DeskDraw** 2.01 \$65.

You can be very persuasive.

For flip charts, overhead transparencies, slides, and audience handouts **PowerPoint** gives you the power to be your most persuasive. It makes it easy to develop coherent presentation formats (fonts, borders, titles, etc.) filled with text and graphics imported from a wide range of programs. You can visually



\$249

rearrange slides, and create hard copy reproductions for memorable handouts. You also get word processing functions, on-screen slide show rehearsal, support for all 16.8 million colors on the Mac II, and support for many B&W and color printers and 35mm recorders. Plus, **PowerPoint** offers an easy interface to slide-production service centers—you can even send color presentations to Genigraphics via disk or modem, using the new Genigraphics Driver and GraphicsLink.

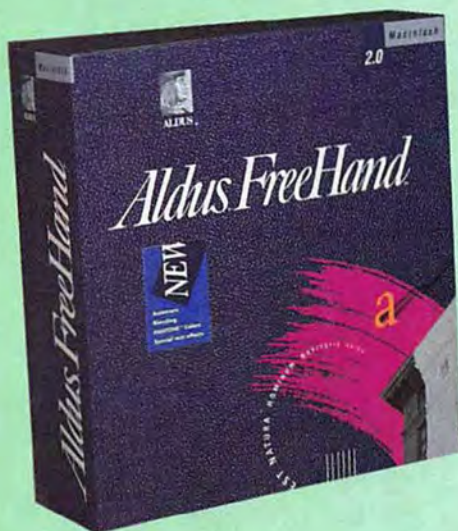
Microsoft ... 30 day MBG
2878 **PowerPoint** 2.01 \$249.

Call 1-800/334-4444 to order.

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Give yourself a FreeHand to develop high-impact illustrations and typography.

Combine Aldus' super powerful drawing program with their best-selling desktop publisher. And in one fell swoop you'll transform your Mac into a fully equipped design studio, ready to create sophisticated newsletters, brochures, ads, flyers, package designs, and anything else you can envision. **Aldus FreeHand** gives you the illustration power. You see your changes on the monitor while you work, so it's easy to refine a shape or apply Pantone colors while keeping the big picture in focus. It also gives you total typographic control for curving text



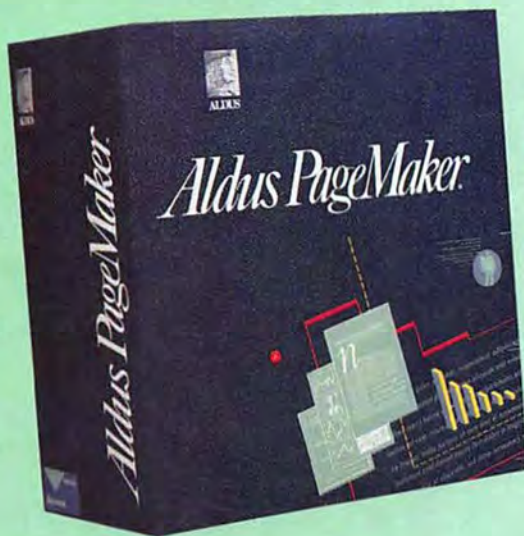
on a path, rotating or stretching type, mixing sizes, fonts, and colors, and, in general, getting words exactly the way you want them before outputting to an expensive typesetter.

Aldus ... **30 day MBG**
 1330 FreeHand 2.02 \$345.

\$345

Then Make your Pages come alive.

Once you've developed your graphics and display type, just place them into **PageMaker** to put your piece together. The two programs are completely integrated, so you can immediately start fine tuning the letter kerning and word wraps, add rules and spot color, and experiment with a multitude of ways of combining your text and graphics. You'll soon discover why this program has single-handedly enabled thousands of designers to make the transition from drawing board to Mac as natural as the



one from waterbed to futon. When you give PageMaker a FreeHand you get a potent combination of advanced illustration, design, typography, and page layout capabilities that will give you a definite creative edge.

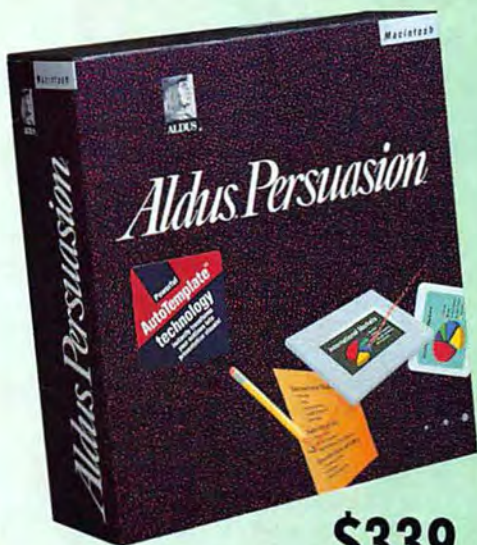
Aldus ... **30 day MBG**
 1331 PageMaker 3.02 \$385.
 6149 PageMaker Color Extension 149.

\$385

30/60 Day Money-Back Guarantee.

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And pour on the persuasion.



\$339

Whether you have weeks or just minutes to create your next presentation, **Aldus Persuasion** will make it easy to assemble the materials, including totally professional black and white overheads, 35mm slides (either with a desktop film recorder, or via a slide bureau), and audience handouts. Thanks to Persuasion's *AutoTemplate* technology, it's as simple as selecting a design, and typing into the text outline—your ideas are transformed into a professional-quality presentation automatically. And, for customizing your work further, just use the built in word processing, drawing, and charting tools. When you're done, you can preview, or even show your entire presentation on screen. The new Version 2.0 can import PowerPoint

and other files saved in Scrapbook format, and features 12 additional AutoTemplate designs (for a total of 36), automatic resizing, context-sensitive Help, and compatibility with Apple's new 32-bit color standard. Plus, you can now type notes directly on your outline and have them appear on your speaker notes next to a thumbnail image of the slide. *InfoWorld* said, "This may be the product that does for desktop presentations what *PageMaker* did for desktop publishing."

Aldus ... 30 day MBG
4751 Persuasion 2.0 \$339.

\$89

Give your words a facelift.

Springboard Publisher II can give any word processing document more pizzazz. With this easy desktop publisher you just point and click to add page layout, graphics, and special effects. Six *SmartArt* PostScript effects let you rotate text, add shadow or distance, make text arc or fade, or stretch text to fill the page. Plus, you get a coupon for 500 pieces of clip art or 36 newsletter templates free! Don't settle for ordinary pages. Start desktop publishing today.

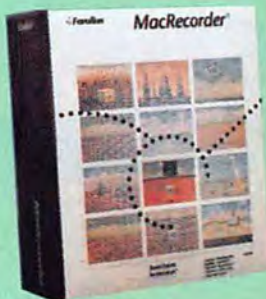
Springboard ... 30 day MBG
4500 Publisher II special \$89.



LOOK GOOD.FAST.

Create a dazzling array of presentations, demos, mini applications, and more, quickly and easily with **HOT-SPOT**, by combining standard graphic and text files. No programming knowledge is necessary. **FLEXFORM Business Templates** is a business form- and data-management system that comes with professionally-designed business forms. Volume I includes A/R and Inventory; Volume II has Administration, Purchasing, and Personnel.

Antic Software ... 30 day MBG
6100 HOT-SPOT \$42.
5756 FLEXFORM
Business Templates I. 49.
5760 FLEXFORM
Business Templates II 49.



\$162

Get into production.

The **MacRecorder Sound System** turns your Mac into a complete audio workshop with a built-in microphone, jacks for external lines, multi-channel mixer, mono or stereo recording options, and special effects. It comes with two applications, *HyperSound* and *SoundEdit*, which let you record directly into a HyperCard stack and make your own stacks that play and record sound.

Farallon Computing ... 60 day MBG
2199 MacRecorder 2.0 \$162.

Call 1-800/334-4444 to order.

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Smooth those rough edges.

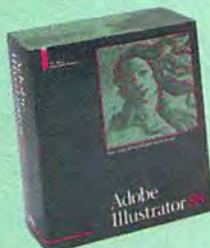


\$109

\$56

Adobe outline fonts. It installs in a couple of clicks and then works in any application. Adobe Type Manager comes with 13 popular fonts including Times, Helvetica, Courier, and Symbol. And, for even more variety, there's the Adobe Plus Pack, giving you the same 22 outline fonts that come with Apple's IIINT and IIINTX LaserWriters. Only now you can enjoy them on your ImageWriter. By the way, for a limited time, Adobe Illustrator 88 comes bundled with a free copy of Adobe Type Manager.

\$279



Adobe Systems

5750 Adobe Type Manager . . . \$56.
6053 Adobe Plus Pack . . . 109.
6156 Adobe ATM/Plus Pack Bundle . 162.
1137 Illustrator 88 1.9 w/ATM . . 279.

You can dramatically improve the quality of your printed ImageWriter text and even make the type on your Mac display smoother and more legible, just by installing **Adobe Type Manager** on any Mac with System 6.0 or later. From then on, it invisibly intercepts QuickDraw font requests and generates smooth PostScript outline fonts in proper screen bitmaps at the correct size. When you print, it will similarly generate the requested printer font bitmap, only, once again, in smooth



GET PRESENTABLE.

With **Cricket Presents** you can develop presentations complete with 35mm slides, color overheads, and handouts. It has a text editor, template libraries, plus graphing and drawing tools. And, you can automatically transform your outline into a professional-quality presentation using the built-in Auto Presents function. **Cricket Graph** was given five mice by MacUser and gives you 12 graph types in up to 8 colors with up to 16 patterns. Graphing's easy as pie with graphic macros, multiple windows, and overlays.

Cricket Software

1668 Cricket Graph 1.31 . . . \$115.
1670 Cricket Presents 2.0 . . . 285.

ALL-IN-ONE PUBLISHER.

Publish-It! is the fully-integrated, completely self-contained Mac desktop publishing system that gives you the text, graphic, and page-layout power you need to create high-impact documents even if you have no previous graphic experience. Special features include text rotation and patterned text, and the ability to edit scanned images *after they are placed into your documents*. It comes with 70 professional sample layouts so you can get started immediately.



\$225

Timeworks ... 30 day MBG

5908 Publish-It! 1.0 . . . \$225.



\$49

SCRIPT IMPROVEMENTS.

Enhance your HyperCard scripting with the **ScriptEdit** DA. It lets you edit multiple scripts on screen simultaneously, even from different stacks. It also features global search and replace functions, a script compare feature, separate undo commands for each editing window, and pop-up HyperTalk command menus. You can access most HyperCard menus while editing, and customize the way you use the editor with the included XCMD.

Somak Software ... 30 day MBG

5897 ScriptEdit 1.0 . . . \$49.



\$95

Beyond HyperCard.

Develop powerful, full-color, HyperCard applications with **PLUS**. You work in a familiar HyperCard-like environment with direct access to existing stacks. There you can create cards up to 32,000 x 32,000 pixels, with buttons of any shape, a multitude of colors (you can even import color graphics), database fields where you can pre-format data, word processing fields, and more. Buy at a special price through 1/31/90, and get a free upgrade to the next version.

Olduvai

5446 PLUS 1.11 . . . special \$95.

Order by Fax 1-603/446-7791.

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HYPER IMPROVEMENTS.

Enhance your HyperCard productivity with these two collections: **HyperTools #1** (16 tools for stack design) and **HyperTools #2** (16 tools for stack enhancements). They let you perform many new functions, from modifying buttons to adding field validation, and they create their own scripts automatically. Also, try **StackCleaner**—a collection of stack management utilities for HyperCard.

Trendware

5202 HyperTools #1 1.02 special \$47.
5199 HyperTools #2 1.04 . special 47.
5203 Stack Cleaner 29.



\$129

Develop yourself!

Packing 32-bit architecture, **Smalltalk/V Mac** has the memory and capacity to let you create full-blown applications at affordable prices. And its object-oriented development environment is ideal for letting the creative juices flow. It works under MultiFinder and gives you complete access to the Mac Toolbox, integration with other languages, a push-button source-level debugger, and portability to 8088, 80286, and 80386 computers.

Digitalk ... **60 day MBG**

5166 SmallTalk/V Mac 1.1 \$129.



DATABASE POWER. HYPERCARD EASE.

Using **HyperHIT's** 40 XFCN's you can finally create your own "keyed" database from within HyperCard. A serious database engine, HyperHIT lets you design simple and sophisticated databases (multiple indexes) while cutting search time to as little as half a second. And you still get the freedom of HyperCard (SuperCard or PLUS) on the front-end. It supports the creation of text, PICT, and snd records, and can run on any Mac that runs HyperCard.

Softstream Int'l. ... **60 day MBG**

5440 HyperHIT 1.0 \$125.



\$125

Get with the program.

Here's the fast direct route to your own programs. With **Microsoft QuickBASIC** you can write as super serious (or super-silly-ous) a program as you like, complete with music and graphics. The compiler and interpreter are all in one program so you can compile and execute at any time with a simple double click.

Microsoft ... **30 day MBG**

4471 QuickBASIC 1.0 \$65.

\$65



\$47

FOR HYPERCARD HYPERNEED.

HyperDA is the DA that gives you access to HyperCard stacks anytime (complete with buttons and fields) from within any application or the Finder. It lets you print and phone dial, search stacks, and copy to the clipboard. Plus you can change your stack screen to an expandable, scrollable window for easy access to your background application. New Version 1.2 lets you add or modify text in existing text fields, and save to the original stacks independently of HyperCard. It works on any Mac from the 512K up.

Symmetry ... **30 day MBG**

3318 HyperDA 1.2 special \$47.



ICOM Simulations

5681 HyperTMON 1.0 \$59.

4085 TMON 2.8.2 89.

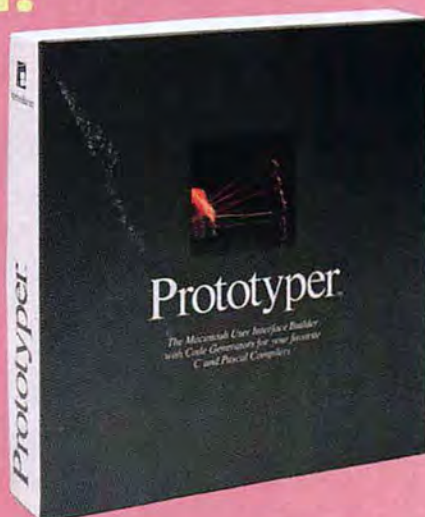
Reduce debugging time and increase productivity with these two debuggers. **TMON** is a multi-window monitor/debugger that will set breakpoints, display labels, intercept system errors, and more. Perfect for the novice as well as the experienced programmer, it was given five mice by MacUser. Exclusively for HyperCard, **HyperTMON** brings interactive debugging to HyperTalk. It can help anyone write more advanced scripts and solve the mysteries of existing scripts.

Call 1-800/334-4444 to order.

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The ultimate prototyper, simulator, and code generator.

\$169



With **Prototyper** you can program your interface as fast as you can draw it. As Dan Shafer, author of *HyperTalk Programming*, put it, this completely integrated interface builder and code generator "makes the process of building a Mac application as easy as it's likely to get." Just click and drag items from a palette to give your program all the buttons, icons, pictures, text areas, check boxes, lists, rectangles, pop-menus, bells and whistles you want. You can run simulations anytime during the process. Then, once you're satisfied, Prototyper will generate all the C or Pascal source code and resources automatically. Your interface is complete. It literally couldn't be easier.

SmethersBarnes ... **30 day MBG**
 1478 Prototyper 2.1 ... special \$169.

MAC REVIVAL.



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Combine one of the world's oldest books with some of the world's newest technology and you get **HyperBible**. This computerized version of the *Thompson Chain Reference Bible* includes all its features and provides an easy link to any word processor. Use it to find verses, trace topical themes, study different characters, view an electronic atlas, study archaeological findings of Biblical sites, and more. It's 15 megabytes of timeless information.

Beacon Technology ... **30 day MBG**
 4967 HyperBible (King James) 1.1 \$145.
 4968 HyperBible (New Intl.) 1.1 ... 175.

THINKING SPEED? THINK C.

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Why is **THINK C** used to create heavy-duty programs like *FoxBASE + /Mac*, *PageMaker*, and *Illustrator*? Speed. And more speed. This ultra-fast development system includes a multi-window text editor, compiler, linker, Mac-style source level debugger, and more. It's a programming powerhouse designed for the pros.

Symantec ... **30 day MBG**
 3420 THINK C 4.0 \$149.



It figures.



Prepare for exams with learning programs from the inventors of *True BASIC*. Let Mac do the calculations and graphing while you master the concepts. **Algebra**, **Pre-Calculus**, and **Calculus** are each available with a valuable workbook. **Algebraic Proposer** handles word problems in math, the sciences, economics, even real life!

True BASIC, Inc.
 3571 Algebra plus workbook ... \$39.
 3580 Pre-Calculus plus workbook . 39.
 3575 Calculus plus workbook ... 39.
 6110 Algebraic Proposer 45.

\$65



GENERIC BRAIN. JUST ADD INTELLIGENCE.

HyperX is the HyperCard Expert System that you can teach to troubleshoot problems or provide advice when you're not around. So you can distribute your expertise anywhere there's a Mac. Applications include intelligent database interfaces, data analysis, computer-assisted instruction, troubleshooting, automation of complex procedures, and executive information systems. It includes powerful features for developing and delivering these intelligent applications. Written entirely in HyperTalk, it also provides an excellent hands-on way to learn expert systems.

Millenium ... 30 day MBG
 6105 HyperX \$65.

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MEGABYTES. NOT MEGABUCKS.

\$195



Blast through the eight megabyte barrier with **Virtual 2.0** from Connectix. Now you can afford more memory than you thought your Mac could have. This simple software package turns your hard disk into as much as 14 megabytes of internal memory. The Mac II version includes a PMMU chip—to make your Mac II System-7-ready today.

Connectix

- 6123 Virtual 2.0 (for SE/30, IIfx, IIfx, and IIfx) \$125.
6122 Virtual 2.0 (for Mac II, includes PMMU) 195.

To your Mac's health.

SUM II is your hard drive magician: it recovers files and crashed hard disks, and even improves disk performance. Its Volume and File Recovery programs use three superior algorithms for triple file recovery power. SUM's friend **SAM** protects your system from viruses, even monitoring peculiar activities that may indicate a virus; and scanning floppies to prevent a virus from infecting your system.



Symantec ... 30 day MBG

- 5176 Symantec AntiVirus for Mac 1.1 (SAM) \$63.
5724 Symantec Utilities for Mac II (SUM II) 95.

Look ma, no program!

\$65



Want to check a file but don't have the application? Need to get some info out of a partially damaged file? Then get **CanOpener**! This clever utility will let you search for and open virtually any file (on a disk, hard drive or network) to check out its text, pictures, even sounds. *Without the application that created it.* Plus, it lets you copy material into your current application, or archive it for future use.

- Abbott Systems ... 30 day MBG
5236 CanOpener 1.1 \$65.

HOLISTIC MEDICINE FOR MAC.

\$55



The new version of **Virex** goes beyond the mere file repair that earned it 4 1/2 mice from MacUser. Now, it actually monitors your system continuously and repairs infected files *before* they have the chance to spread their evil corruption through your helpless bits and bytes. There's also a new diagnostic tool for detecting previously unknown viruses. And the annual update service lets registered users get protection for new viruses within days of the first reports.

HJC Software ... 30 day MBG

- 4803 Virex 2.1 \$55.
5885 Virex 2.1 (10 Pak) 349.

Make it big. Play it safe.



Get big screen vision on a small screen with **Stepping Out II**. It lets you scroll across pages in a mouse click, zooming in to work on details, or zooming out for the big picture, via 16 levels of magnification and three levels of reduction. And to prevent screen burn-out, use **After Dark**. Choose from 12 wild images, including flashing lightning bolts, streaking meteors, and crawling worms, or create your own.

Berkeley Systems ... 30 day MBG

- 5737 After Dark 1.0 ... special \$22.
1541 Stepping Out II 2.01 special 45.

WHAT'S APP, DOC?

\$29



HandOff eliminates the dreaded "Application Not Found!" message. No more searching for applications to open the documents that you borrow from your friends and co-workers. HandOff will let you assign *their* documents to *your* applications so you can open their files directly from the Finder. HandOff also lets you redirect files to any application based on the filename extension. Jean-Louis Gasse calls it "a nice, unobtrusive and very much needed extension to Macintosh."

Software Innovations ... 30 day MBG

- 5869 HandOff special \$29.

Call 1-800/334-4444 to order.

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POWER TWINS.

MacCalc is the easy-to-learn, easy-to-use, super-fast spreadsheet that's earned a MacUser Editor's Choice Award, and been called a "must have" by MACazine. It features extensive formatting, and support for .WKS files, for compatibility with 1-2-3 and Excel. And, through 1/31/90, we're bundling it at a special price with Bravo's SPAMM, the automatic INIT utility that can double the speed of calculations for your graphics, CAD/CAM, statistics, database work, and virtually all arithmetic operations on your Mac Plus or SE.

Bravo ... **30 day MBG**

5404 SPAMM 1.1 \$48.
 1539 MacCalc 1.2D 79.
 6084 MacCalc/SPAMM . special 115.



BACKUP AND SPOOL.

DiskFit automates your backup chores intelligently, backing up just those files that have changed. There's a network version available, and it's MultiFinder compatible, so you can keep on working while backing up. With SuperSpool you can even print while you work. The original is just for ImageWriters. The laser version works with all Apple printers and is also available in an economical 5-Pack.

SuperMac Software ... **60 day MBG**

3377 DiskFit 1.5 \$58.
 3379 Network DiskFit 1.5 225.
 3383 SuperSpool 5.0 58.
 3382 SuperlaserSpool 2.0 88.
 3378 SuperlaserSpool 5-Pack 2.0 295.



\$52

MANAGE YOUR ENVIRONMENT.

XTreeMac integrates disk management with file undelete and security protection. Its unique interface gives you a clear Directory Tree on the left and a DeskPad working environment on the right. There you can gather, rearrange, or delete files and folders from multiple disks, launch applications, lock files, and even recover accidentally deleted files. All on one screen, not multiple layers of windows.

Xtree ... **30 day MBG**

5177 Xtree Mac 1.02 \$52.

HOLY MACRO! FREE TEMPLATE!

Tempo II makes simply powerful macros, either from existing text and graphics or by recording unlimited keystrokes and clicks. An amazing time-saver, it can automate any routine, with pauses, conditional branch and repeats, "smart" features like window- or screen-relative recording, and "play-by-name" simplicity. Plus, through 1/31/90, you'll receive a free keyboard template (\$9.95 retail) to keep track of your macros.



\$75

Affinity Microsystems ... **60 day MBG**

1016 Tempo II 1.02 \$75.

TRUE ARCHIVING.



\$152

With Retrospect, you can put inactive but still useful files where they belong: in an archive. Free valuable hard disk space by moving files into the archive—you can access them later via a catalog on your hard disk. Or copy files into the archive for backup. It supports disks, tapes, optical cartridges, file server volumes, etc.—if it can hold data, Retrospect can archive or backup to it. And it includes file compression and a calendar for unattended operation.

Dantz Development ... **30 day MBG**

5255 Retrospect 1.1 \$152.

THIS BEEP'S FOR YOU.



Wake up, Mac users! Smart Alarms will beep you at any appointed time, remind you what to do, and can even generate printed schedules. Appointment Diary is a daily calendar that can send reminders directly to Smart Alarms. The multi-user versions lets everyone on AppleShare or TOPS have identical or individual diaries.

JAM Software ... **30 day MBG**

6089 Smart Alarms w/Single-User Appointment Diary \$49.
 6088 Multi-User Appointment Diaries w/Smart Alarms (1-4 users) .. 99.
 6087 Appointment Diaries (5-8) .. 149.
 6086 Appointment Diaries (9-15) .. 199.
 6085 Appointment Diaries (16-25) 299.

No Surcharge on Credit Card.

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\$79

LABEL TEMPLATES. AT LAST.

Formatting a document for label printing can make anyone yearn for a nice old-fashioned typewriter—unless, of course you have **StickyBusiness**, the program that gives you *preformatted templates* for labels, cards, and tags from Avery, MOORE, Rolodex, Inmac, NEBS, UPS, Dennison, and Williams & Macias. It includes tools for creating your own imaginative designs, and you can import graphics from other files. Plus, it's compatible with text files from all leading applications.

Williams & Macias ... **30 day MBG**
4976 StickyBusiness 1.0.7 special \$79.



3 ways to play it safe.

\$107

MacSafe II lets you secure your documents and applications inside password-protected folder-like safes on a hard disk, diskette, or network. The latest version features exclusive LightningCrypt encryption, Control Panel access, and the ability to put multiple files into a safe at once. For nighttime protection put **The NightWatch** on duty. Your hard disk will be locked up until you turn it back on with the correct password. And only you have access to the override function (in case of forgotten passwords). When



\$87

The NightWatch



\$57

you leave your desk and want to keep anyone else from seeing your work or accessing your network connections, **QuickLock** darkens your screen, displaying only a moving image that protects your screen from burn-in, while allowing background processing. To regain access to your screen, simply type in the access password. Three simple, elegant, and secure solutions.

KentMarsh Ltd. ... **30 day MBG**
5457 QuickLock 1.0 \$57.
2591 The NightWatch 1.03 87.
6134 MacSafe II 107.

NO MORE ACHING BACKUPS.

Anyone can trash a file or a disk. Which means that everyone needs a backup program that anyone can use. With **Redux**, two clicks back you up. For custom backups, just tell Redux what to do in simple English(!) commands. Need to perform a complex backup regularly (e.g. all spreadsheets in certain folders over 20K)? Redux will reduce it to two clicks so even a novice can do it.

Microseeds Publishing **60 day MBG**
2913 Redux 1.5 special \$46.



\$46

LAUNCH ON CUE.

On Cue whisks you quickly and smoothly from program to program without accessing the Finder! It lets you travel between documents and applications in record-breaking speed. No more waiting for files to open and close, or getting lost in the desktop maze. When running MultiFinder, On Cue allows you to switch applications simply by pressing the command-option combination. Compatible with all Macs from 512KE on up.

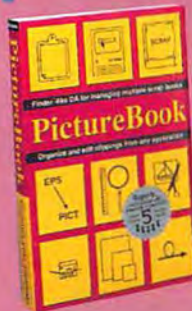
\$35



ICOM Simulations
4084 On Cue 1.3 \$35.

CLIPPING SERVICE.

\$39



PictureBook is a powerful Finder-like DA that organizes your clippings into multiple scrapbooks. You can name and annotate each clipping, track creator name and date, move clippings between multiple windows by simply clicking and dragging, and print scrapbook catalogs. Plus, the integrated editor lets you precisely crop or re-size. PictureBook can directly read PICT, MacPaint, and EPS files, converting all EPS to PICT. Rated five mice by MacUser.

Loop Software ... **30 day MBG**
5442 PictureBook \$39.

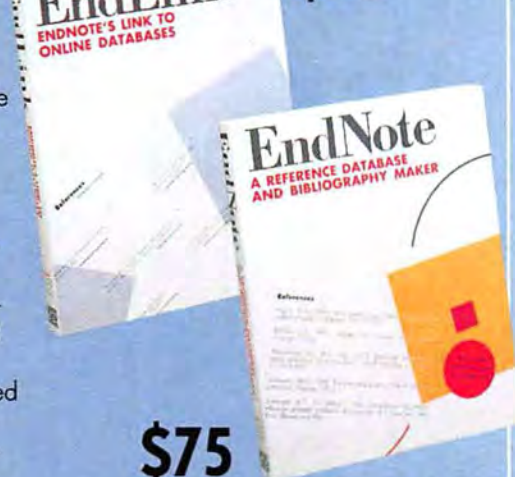
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Ultimate reference tool.

How much time do you spend tracking down references you've used before? How about re-typing the same bibliographic entries? **EndNote** lets you create and update a personal database of up to 32,000 references which you can access anytime, searching by author, year, or any word in the text. (Full logic searches are also supported.) The data from those references can be pasted directly into your word processing document as citations, just the way you need them. Then, the program will generate your bibliography automatically, formatted in any style. EndNote works either as a DA or as an application and is compatible with Word, MacWrite, WriteNow, and WordPerfect. Its companion program **EndLink** lets you import references directly from on-line services into your EndNote database. It works with MEDLINE, BIOSIS, Chem Abstracts, and other databases available on DIALOG and BRS Colleague. *MacUser* (2/89)

EndLink \$58



\$75

gave EndNote 4½ mice and said, "almost like magic, the bibliographic chores of your writing task are finished."

Niles & Associates ... **30 day MBG**
5048 EndLink 1.0 \$58.
4602 EndNote 1.2.1 75.

Compare and save.



\$89

DocuComp is the fast and accurate way to show differences between two versions of anything from a contract to a book to source code. Even documents from different word processors can be displayed simultaneously, revealing insertions, deletions, replacements, and moves. The comparisons can be saved or printed as needed. A great time saver for technical writers, editors, lawyers, programmers, educators, and others. **Advanced Software** ... **30 day MBG**
5608 DocuComp 1.11 \$89.

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RésuméExpert comes in four extraordinary editions that will let your all-important career-related documents dress for success on Microsoft Word or Works—whether you're a student or a CEO. The templates in "original" **RésuméExpert** will produce expertly tailored resumes for almost any career. The other editions are for cover letters, sales and marketing, and management careers. The manuals even include valuable writing tips.

A Lasting Impression

5465 **RésuméExpert** special \$35.
5853 Sales & Marketing . . . special 35.
5852 Management Edition . . . special 35.
5749 Cover Letters special 35.

\$225

Word processing heaven.

Nisus has enough word processing power for even the most serious textpert. It boasts ten clipboards; extensive editing features like unlimited undos; and a lightning-fast search and replace facility that's font- and style- (including color) sensitive, can search by matching patterns, and can even look through unopened files. You also get a spell checker and thesaurus, integrated graphics, versatile formatting, an editable page preview, 50 useful macros (or write your own), and much more.

Paragon Concepts ... **30 day MBG**
5683 Nisus 2.03 special \$225.

\$99



BUY RIGHT NOW. GET ART FREE.

Though 1/31/90, you'll get a free copy of **ClickArt Personal Graphics** (\$49.95 retail value) when you buy the word processor that's been called "Best New Word Processor" (*MacUser* 5/89) and "Readers' Choice" (*MACazine* 1/89). **WriteNow** is an elegant combination of simplicity and power, featuring WYSIWYG editing, 100,000 word spell checker, multiple columns, mail merge, and many other claims to fame.

T/Maker ... **30 day MBG**
3639 **WriteNow 2.0** (with **ClickArt Personal Graphics**) . . . special \$99.

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One Word says it all.

Whether you're a salesperson, scientist, secretary, or just writer of the occasional love letter, **Microsoft Word** has all the formatting, editing, and printing power you need. Integrated outlining lets you get your thoughts in order before writing a single word and reorganize whole documents with a few clicks. Store and summon your favorite formats with Style Sheets. Avoid nasty gaffes and faux pas with the 80,000-word spell checker. The QuickSwitch feature lets you go to other programs in a single keystroke and bring back graphics just as fast. The new and powerful Table feature lets you create columns, charts, lists, and forms without tabs. And simple to use? The menus are flexible and customizable to meet the needs of everyone from novice to expert.



\$249

Microsoft ... **30 day MBG**
4969 Microsoft Word 4.0. . . . \$249.



\$64

Complete outline tool.

Acta Advantage combines the convenience of a DA outliner for putting down rough notes anytime, with the full features of an application for developing polished outlines. The latest version of the DA lets you mix faces, styles, and sizes at will, and specify page breaks for printing. The application adds a full menu bar plus your choice of Harvard, Roman, or bullet outline labels, page preview, printing options, and more.

Symmetry ... **30 day MBG**
4504 Acta Advantage 1.0 special \$64.

GRAMMAR & BIBLIO FILES.

Catch grammatical errors in any text file before your colleagues or clients do. **Sensible Grammar** flags awkward writing, jargon, inappropriate contractions, etc., and suggests corrections. To manage references for your newly improved writing, try **Bookends**, a sophisticated HyperCard database that stores all your reference data and then generates bibliographies in whatever format you need.



Sensible Software ... **30 day MBG**
3375 Grammar 1.5.4. . . special \$51.
4692 Bookends 1.1.7. . . special 51.

INCREDIBLE QUICKIES.

QuickLetter makes writing letters and printing envelopes a snap. You don't even have to use pre-printed stationery—QuickLetter lets you print your own picture letterhead. Just write your letter, view it in Page Preview, and let QuickLetter address your envelopes automatically, even while you're working in another program. This DA word processor also has full font and style control, and a built-in address book. *MacUser* 10/89 gave it 4½ Mice and said that it's "quickly earned a place on my most-used DAs list."

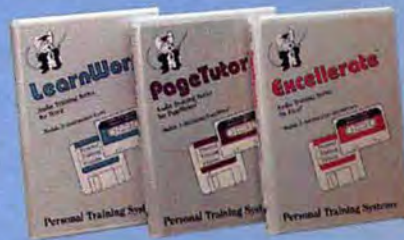


\$73

Working Software ... **30 day MBG**
4699 QuickLetter 1.01. . . . \$73.

LISTEN AND LEARN. \$39

Become a power user at your own pace on your own Mac by listening to an expert talk you through the program step by step while you try each new skill. Each 90-minute tutorial includes an audio cassette, example files on disk, and quick reference card.



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PARLEZ POWER.

Now you can use your Mac along with the top-selling audio language program to master a foreign tongue. VocabuLearn/ce interactive HyperCard Stacks are available in two levels for French, German, Italian, Spanish, and Japanese. Each program includes two 90-minute audio cassettes, a complete word list, and a free copy of HyperCard V. 1.2.

Penton Overseas ... 30 day MBG	
Level 1	Level 2
5864	5887 French ea. \$30.
5865	5889 Italian ea. 30.
5867	5891 Spanish ea. 30.
5868	5888 German ea. 30.
5866	5890 Japanese ea. 36.

STARS IN YOUR EYES.

\$89



Launch **Voyager** and explore the vastness of space. This planetarium program entertains and educates with a 14,000-object database of deep-sky objects, stars, planets, comets, and asteroids. View from anywhere in the Solar System at any date from 1000 B.C. to A.D. 4000. You can even enter custom orbits and print out charts. MacUser gave it five mice and said, "Voyager will not only assist the current generation of astronomers, but may also inspire the next."

Carina Software
 5726 Voyager 1.2 \$89.



\$27

Who dunnit?

Who put the fun into math equations, word problems, and logical thinking? No, the butler didn't do it, Davidson did. With **Math Blaster Mystery**. For ages 10 and up, Math Blaster Mystery is the exciting and entertaining way for children to master a variety of math and problem solving skills. It runs on a Mac Plus, SE, SE/30, IIcx, or II, and can be installed on your hard disk.

Davidson & Associates
 1734 Math Blaster! 1.0 (CP) . . . \$27.
 6128 Math Blaster Mystery (CP) . . 27.

COMPOSE YOURSELF.

Your Mac can make music magic with **Super Studio Session**. You can compose using many instruments, tempos, and key signatures, and play it all back on your Mac or home audio system. No synthesizer is needed. Write and play back on eight tracks using over 90 instruments. The complete library offers over 320 different instruments and sound effects. Supports AppleTalk links.

\$65



Bogas Productions ... 60 day MBG
 4255 Super Studio Session 2.0 . . . \$65.
 6135 Super Studio Session Bundle Pack
 (incl. Rock, String Quartet, Country,
 Brass, & Sound Effects) special 99.

YOUR PERSONAL MUSIC TUTOR.

\$72



Learn to read and write music, develop your ear for intervals, chords, melody, and rhythm, and have fun while doing it with **Practica Musica**. Just point and click on the screen, keyboard or use a MIDI instrument. Called "a sensational learning program" by MacUser (11/87), it features high-quality sound, interactive notation, and a coordinated textbook. For both beginners and advanced students.

Ars Nova ... 60 day MBG
 1215 Practica Musica 2.1 \$72.

HYPER-ANIMATED LEARNING.

\$45



Learning letters and their sounds is far more enjoyable thanks to HyperAnimation, which combines real speech sounds, synchronized with correct facial motions. Children can improve their letter recognition by following the Talking Elf in **Alphabet Blocks**. To transform learning phonics into play use **Talking Tiles** whose on-screen tutor spells and pronounces words. Get both of Bright Star's two learning programs together at a special price through 1/31/90.

Bright Star Technology
 6096 Talking Tiles 1.0 & Alphabet
 Blocks 1.0 special, both for \$45.

No Hidden Charges.

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\$29



Guess what? It's 2004 and San Francisco is ruled by aliens. Your job is to work undercover "with" the aliens, in order to penetrate the hideout of a band of renegade Ninjas and defy the Pig-Monkey mutants to win freedom for all humankind. But it's hard when creatures out of your worst nightmares stalk the familiar streets and sights of the City by the Bay.

Sierra On-Line
5694 Manhunter: San Francisco . \$29.

\$39



DEAL YOURSELF IN.

Ready for a little two-handed, four-handed, or five-card Cribbage? How about some good old standard Gin or Oklahoma Gin? With **Cribbage King-Gin King**, you can play against seven computer personalities, ask their advice, then improve your game and beat them. Modern play techniques and sophisticated probability analysis make for hours of serious good times. *The New York Times* (10/10/89—you can look it up) claims it manages to "imitate that elusive quality, card sense, in a box of transistors."

Software Toolworks ... **30 day MBG**
6111 Cribbage King-Gin King . \$39.

PURSUUE GLOBALLY.

\$32



Wondered what the Trilateral Commission's been up to lately? **Moriarty's Revenge** lets you join the Scotland Yard Irregulars in relentless pursuit of the world's most diabolical criminals, who belong to the ten secret societies that rule the world of crime and threaten the very fabric of civilization (what's left of it). You can travel the globe, unraveling the evil deeds of these nogoodniks, visiting exotic locales, meeting bizarre new people, and save the world to boot...again.

Bull City Software ... **30 day MBG**
5841 Moriarty's Revenge \$32.

ARE YOU GAME?

The **TaskMaker** takes you through ten challenging tasks in which you fight off some truly nasty creatures in order to restore prosperity to the depressed, devastated world. **NFL Challenge** can make any Sunday super by pitting all 28 NFL teams against each other at varying levels of difficulty, taking into account different players' special talents. Or head for the links with **MacGolf Classic**. You get to use all 14 clubs on 108 different holes complete with awesome graphics and sound effects.



XOR
6152 TaskMaker (CP) \$27.
4320 MacGolf Classic (CP) 53.
3815 NFL Challenge (CP) 57.

ENTERTAINMENT GROUPWARE.

These two games transform your computer network into an action-packed battle field. **Strategic Conquest** is the realistic war game that dares you to explore and conquer an unknown, enemy-infested world. And, for adventures of another class, launch **NetTrek** and attempt galactic colonization in this real-time space battle simulator. Both allow you to challenge your Mac or other network users for hours of full color, networkable entertainment.

\$35
EACH



Premier Technology
5773 Strategic Conquest Plus 2.0 \$35.
5774 NetTrek—The Real Version . . 35.

GET JET. QUICK.

Take the controls of a carrier-based F-18 or a land-combat F-16 and pit yourself against your friends or your Mac. You can even fly with others (like in *Top Gun*). **Jet** lets you choose from a breathtaking array of Scenery Disks. And, to help you take off faster, we're bundling Jet with the **Kraft QuickStick** at a special price. The QuickStick plugs right into your mouse port, and features both auto-centering or free-floating operating modes. Offer good through 1/31/90.

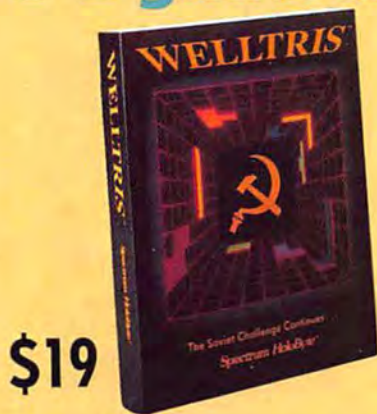


SubLogic & Kraft ... **60 day MBG**
4698 Jet \$32.
2600 3-Button QuickStick 39.
4082 3-Button QuickStick ADB . . . 49.
6113 Jet & QuickStick . . . special 59.
6138 Jet & QuickStick ADB special 69.

Call 1-800/334-4444 to order.

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3-D grid lock?



\$19

Alexey Pajitnov's *Tetris* could challenge parts of your brain you didn't even know you had. Well, his sequel, *Welltris* will send you into another dimension altogether, where you'll spend many challenging hours staring deep into a four-sided well with grid-like walls while you try to position falling pieces quickly and accurately on the bottom grid.

Spectrum HoloByte ... **30 day MBG**
 6112 Welltris \$19.

Have your Mac and PC it, too.

Are you still doing part of your computing on a DOS machine and part on a Mac? Well, now you can put an end to such silicon schizophrenia. Because **SoftPC** gives your Mac II, IIx, IIfx, IICx, SE/30 or 68020-accelerated SE true MS-DOS compatibility. So you can run any PC application, from best sellers to in-house programs, right on your Mac. Plus you can run PC and Mac programs at the same time, and even cut and paste between Mac and PC applications via MultiFinder. There's no hardware. No hassle. Just install SoftPC on your Mac, double click, and get the best of both worlds.

Insignia Solutions
 4089 SoftPC 1.3 \$245.

\$245



Bombs away!



\$26

Bomber is an intensely realistic action/adventure game recreating the sights, sounds, and split-second decisions of the young B-17 crews in the skies over Nazi Germany. You get digitized sound, animation, and a ten-man crew to talk you through the tough ones. It runs on everything from a Mac Plus to a IIfx. HyperCard required.

Inline Design ... **30 day MBG**
 5870 Bomber (incl. headphones) \$26.

MAC CRUISE CONTROL.

Reduce your CompuServe on-line time and costs with **CompuServe Navigator**. It can automatically log on, take care of your Forum business, check stock quotes and pending electronic mail, download files, and then log back off. And it can do all this unattended, or in background. Winner of the 1989 SPA Telecommunications Award, it's available at a special price through 1/31/90 and you'll receive an upgrade to Version 3.0 directly from CompuServe.



\$39

CompuServe ... **60 day MBG**
 1673 Navigator 2.1 ... special \$39.

No Sales Tax.

\$249



Special delivery.

Your workgroup's productivity will soar when you start sending messages, files, even graphics created with other Microsoft programs via **Microsoft Mail**. This electronic mail system lets everyone on your AppleTalk network communicate easily with each other (even PC and VAX users), and provides a gateway to AppleLink and MCI Mail.

Microsoft ... **30 day MBG**
 5856 Microsoft Mail 2.0 Server . \$249.
 5858 Microsoft Mail 2.0
 Workstation 84.
 5857 Microsoft Mail 2.0 (20 Pack) 969.

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\$24

Dial the Dow.

The Dow Jones News/Retrieval Membership Package brings current business and investment facts, figures, and full-text articles from over 50 Dow Jones Services directly to your Mac. It comes with the E-Z Online communications disk for easy access to those services and a User's Guide for finding the facts you want fast. Plus, you get five hours of usage time and your first year's annual service fee free!

Dow Jones ... 30 day MBG

5295 News/Retrieval
Membership Package \$24.

GO OVER THE TOPS.

TOPS transforms any Mac into a TOPS network station, able to share files, printers, and multi-user applications. As you add workstations, maintain your network performance by virtually tripling network capacity with the TOPS FlashBox. It installs in minutes. And, for communications software there's TOPS InBox. Use it to send messages and memos just by pressing a few buttons, and to receive your messages whether you're Mac is on or off.



TOPS ... 30 day MBG

4598 TOPS FlashBox \$123.
3723 TOPS Mac 2.1 137.
4714 InBox Starter Kit 2.2 149.
4715 InBox Connection Mac 2.2 . 45.

Take a look or take over.

The key to successful network training, troubleshooting, and file/peripheral sharing is the ability to actually observe and/or control another Mac. And that's the power Timbuktu gives an AppleTalk network. Not only can two colleagues share files, compare notes and help each other out, but even multiple users can share screens for mass Mac meetings or training sessions. All you need is



a copy of Timbuktu at each Mac. With a copy of Timbuktu/Remote and a modem at each location, you get the same power over dial-up lines, serial links, or ISDN services. Timbuktu/Remote also includes a chat window and file transfer for the ultimate in file management between two remote sites.

Farallon Computing ... 30 day MBG

5707 Timbuktu 3.0 \$95.
4866 Timbuktu/Remote 1.0.1 ... 129.
4867 Timbuktu 30-Pack 3.0 ... 1325.
5893 Portable Pack (incl. two copies
each of Timbuktu & Timbuktu/
Remote, two StarConnectors, and
accessories) 375.

THE INCREDIBLE EXPANDING NETWORK.



First, Shiva introduced NetBridge which let AppleTalk networks expand to hundreds of Macs, laserWriters, and other network devices. Now two AppleTalk or PhoneNet networks can be connected over any distance, with a TeleBridge and modem at each end. You even get dial-in network access so a single Mac and modem can access any TeleBridge network resource from any phone.

Shiva ... 30 day MBG

4347 NetBridge \$339.
4942 TeleBridge 339.

COMMUNICATION REVELATION.

The new version of best-selling telecom software MicroPhone II lets you build front ends to information services and corporate mainframes. It also supports ZMODEM, XCMDs and XFCNs, European languages, icons, color, and sound. Using built-in modem drives, it works with any modem to transfer documents for you anywhere in the world... with super reliability at a super low price.



\$219

Software Ventures ... 30 day MBG
3455 MicroPhone II 3.0 \$219.

Call 1-800/334-4444 to order.

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Transfer data. Codes and all.



With **MacLink Plus**, you don't just transfer data between Macs and PCs (at up to 57,600 bps), you retain *all the correct styles and formats*. And now it lets you do the same with Sun and NeXT systems too. The **MacLink Plus/Translator** library now includes over 100 translators. So, for example, you can send a MacWrite or Word document to your PC to appear correctly in WordPerfect, WordStar, MultiMate, XYWrite, etc. Or, you can send your PC's dBASE, 1-2-3, Multiplan, Symphony, or DIF file, with all formulas and formats intact, to your Excel, Multiplan, or other Mac application. All it takes is a

couple of points and clicks between two familiar Mac file windows. MacLink Plus comes complete with a direct connect cable to your PC's serial port (or you can use a Hayes-compatible modem) and software for both the Mac and the PC. If your Macs and PCs already share a network or server, then you can buy the Translators separately. Welcome to the world of real file exchange.

DataViz ... 60 day MBG
 1823 MacLink Plus/PC 4.1
 (includes Translators) . . . \$125.
 4842 MacLink Plus/Translators 4.1 . 99.

THIS PACK SAYS IT ALL.



\$199

Get on line quickly, easily, and cost-effectively with the **Mac Communications Pack**. It includes the external **PM 2400SA** modem (platinum color to match your Mac), installation cable, and **Microphone 1.5**, the popular communications software. This superior, standalone, USA-made modem is Hayes compatible, accepts pulse or touch-tone dialing, full- or half-duplex operation, and features automatic adaptive equalization for error-free operation.

Practical Peripherals
30 day MBG

3089 Mac Communications
 Pack 1.5 special \$199.

COMMUNICATION ART.



White Knight 11 takes over where its popular predecessor **Red Ryder** left off. It supports four XMODEMs, three YMODEMs, three Kermit's, ZMODEM, and Flash protocols, emulates TTY, VT52, VT100, and VT102 terminals, and supports Color QuickDraw and large monitors. The interface can be customized and its improved Host Mode and 200+ command Procedure Language let you fully automate any session. And, for a limited time, it comes bundled with a free copy of **Okyto 1.0**—the revolutionary Mac-to-Mac file transfer program, and a free subscription to **GENie**.

Freesoft ... 60 day MBG
 6115 White Knight 11 \$89.



\$325

FAST, CONVENIENT SCANNING.

The **ScanMan** hand-held scanner from Logitech offers a fast, easy way to add the dazzle of non-computer images to your Mac documents. It comes with convenient editing software that can be used as a standalone application or DA to resize, rotate, flip, or crop scanned images. Scanned images are displayed in 32 shades of gray, and you can set the resolution from 100-400 dpi, choose from three settings for photo scanning, and adjust contrast.

Logitech ... 30 day MBG
 5082 ScanMan Mac \$325.

SIMPLIFY YOUR PRINT LIFE.



LabelWriter is the first printer designed just for labels. It's whisper quiet, maintenance free, and produces letter-quality 1" x 1 1/2" labels (even machine-scannable bar codes) on 130-label rolls. Bundled software lets you use existing lists, create new ones, and format in any style. The **Organizer** from CoStar raises your LaserWriter II to desktop height and has storage for extra paper, paper trays, toner cartridge, and even a Hard Disk 20. And it comes on casters so it's easy to roll over to a colleague's desk.

CoStar ... 30 day MBG
 6090 LabelWriter \$189.
 6067 LabelWriter Labels 11.
 6091 The Organizer 239.



Overnight Shipping \$3.

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\$369

SCAN BY HAND.

Now one quick pass of your hand brings images and text up to 4.2" wide into your Mac. **LightningScan** is the hand scanner that saves and edits in true gray scale. The built-in memory makes it extraordinarily fast, and its new DA software can resize, calibrate, rotate, and flip in a flash. In fact, it was rated the top Macintosh hand scanner by both *Publish!* and *MacWEEK*.

Thunderware ... 30 day MBG
4994 LightningScan \$369.
3648 ThunderScan 5.0 with
PowerPort 187.
3645 Mac II Power Accessory ... 45.

KEYBOARD CONTROL.

Work as fast as a mouse without leaving the keyboard. The **Datadesk Mac-101** is a full-size DOS-style keyboard that comes with 15 very functional function keys and the software for assigning them program commands, menu selections, and mouse movements. *MacWEEK*, called it "the most important accelerator you can buy for a Macintosh."



\$139

Datadesk ... 30 day MBG
1819 MAC-101 Keyboard
(beige) \$139.
1820 MAC-101 Keyboard
(platinum) 139.
1821 MAC-101 Keyboard (ADB). 139.
Foreign keyboards available in
French, German, Spanish, and
the U.K. call



THE BIG PICTURE.

The full-page (15") and two-page (19") B&W **Nutmeg Monitors** deliver ultra-high resolution, flicker-free viewing for hours of desktop publishing, CAD/CAM, etc. Both feature 72 dpi resolution and come with a built-in tilt and swivel stand. And, through 1/31/90, we're offering special prices on the entire 19" line.

Nutmeg Systems ... 30 day MBG
2993 15" for Mac II \$799.
2992 15" for Mac Plus 999.
2994 15" for Mac SE 999.
4002 19" for Mac Plus... special 1195.
4096 19" for Mac SE... special 1195.
5680 19" for Mac SE/30 special 1195.
4097 19" for Mac II... special 1195.

COMPLETE SCANNING.

Here are two versatile personal scanners, ideal for desktop publishing. Both come with **SmartScan** software to resize, scale, rotate, crop, and edit any image. Three dithering patterns give you a 16-level gray scale. **TheComplete Page Scanner** lets you scan any page of text, drawings, photos, etc. up to 8 1/2" x 14" at either 200 or 300 dpi. **TheComplete Half-Page Scanner/400** can handle image sizes up to 4.1" x 14" at 200, 300 or 400 dpi.



TheComplete PC
6104 TheComplete Half-Page
Scanner/400 \$315.
6103 TheComplete Page Scanner 759.

GET ON A ROLL.

The **Kraft ADB Trackball** doesn't use up valuable real estate on your desk, because it stays put while your cursor takes off. Three switchable cursor speeds let you choose the response range that's most comfortable for your applications. It plugs right into the mouse port, runs all mouse software, and delivers ultra-sensitive and accurate response. Plus, Kraft's opto-mechanical design and quality construction is backed by a five year warranty. Complete with foot pedal!

\$79



Kraft ... 60 day MBG
6099 Kraft ADB Trackball
(with foot pedal) \$79.

SCAN WORDS AS WORDS.

\$549



It's no fun trying to edit text with drawing tools. **OmniPage** text recognition software can read virtually any font in sizes from 8 pt. to 72 pt. as scanned by any popular scanner, into any popular word processing format. Besides regular text, it can read spreadsheets and other financial documents, 11 of your favorite Indo-European languages, and even decipher pages with both text and graphics.

Caere
4476 OmniPage 2.0 \$549.

Call 1-800/334-4444 to order.

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Speed demons.

The awesome productivity benefits of Mac software can be lost while you're waiting for that spreadsheet to calculate, database to sort, or CAD image to arrange itself. An accelerator card from Dove can improve your performance by 55%. The **Marathon 020** series gives 1 or 4 Megs of additional memory to your SE, along with a 32-bit microprocessor operating at 16 MHz (faster than a Mac II!). And you can double the speed of calculations

with the optional math co-processor. The **Marathon 030** series enhances your Mac SE/30, II, or IIx's performance with a 256K internal data cache, 256K instruction cache, and full 32-bit microprocessor operating at 32 MHz. And, new from Dove, is the **Marathon Racer**, the cost-effective way to take advantage of Dove's cache technology to make your Mac II perform an average of 20% faster.



\$879

Dove Computer ...	60 day MBG
1793 MaraThon 020 MSE1 ...	\$429.
1794 MaraThon 020 MSE2	
(1 Meg)	699.
1795 MaraThon 020 MSE3	
(math chip)	589.
1796 MaraThon 020 MSE4	
(1 Meg/chip)	879.
5192 MaraThon 020 MSE5	
(4 Meg)	879.
5193 MaraThon 020 MSE6	
(4 Meg/chip)	1099.

Note: Each Marathon 020 is also available in a FastNet LAN version which adds Ethernet connectivity to other Macs or networks.

4663 MaraThon 030 Accelerator	
32 MHz	969.
5878 MaraThon 030x Accelerator	
32 MHz	969.
5880 MaraThon 030 SE/30	
Accelerator	969.
5623 MaraThon Racer	149.

We also carry the complete line of Dove MacSnap memory enhancements and FastNet networking products. Call for details.

The cutting edge of storage.

Cutting Edge Hard Drives arrive at your door pre-formatted and ready to boot automatically. They feature automatic head parking and dual SCSI ports for daisy chaining. You get access times as low as 23 milliseconds, and a mean-time-between-failure rate of up to 100,000 hours. All at a great price.

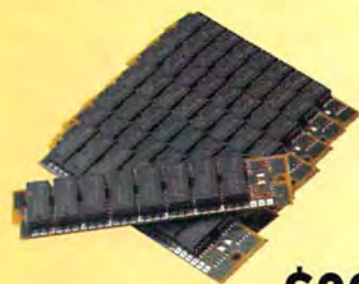
up to 1.2 meg per second. Cutting Edge also solves your disk swapping dilemmas with this **800K External Disk Drive**. It formats at 400K or 800K HFS, and is light enough to take home or across the hall. Plus, it's so quiet you need to check the LED indicator to see if it's working.



Now, if your storage needs are unlimited but your budget isn't, you'll want to check out the new **45MB Removable Hard Drive**. You get all the benefits of the popular SyQuest mechanism without the high price. And whenever you need more storage, all you have to do is buy extra cartridges. It features automatic head parking, super fast 25 millisecond access time, and it can transfer data at

Cutting Edge ...	30 day MBG
3989 800K External Disk Drive	
(platinum)	\$149.
5133 20 Meg Hard Drive	439.
3990 30 + Meg Hard Drive	499.
3991 45 + Meg Hard Drive	549.
5275 65 + Meg Hard Drive	629.
5276 80 + Meg Hard Drive	739.
5456 45 Meg Removable special	889.
5736 44 Meg Removable	
Cartridge	115.

BITS O'POWER!



\$99

Crank your system memory to the max with MacConnection's very own, very reliable **80ns SIMMs**. These surface-mount 1 Meg SIMMs plug in easily, and are completely compatible with your Mac. Add 2 Meg at a time to your Plus or SE to a maximum of 4 Meg. For your SE/30 on up, add 4 Meg at a time to a max of 8 Meg. Every MacConnection SIMM carries a two-year warranty.

MacConnection	
1107 1 Meg, 80ns SIMM	\$99.

Unlimited Toll-Free Technical Support.

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\$589

**Drive
time.**

From the folks who introduced the first SCSI hard drives for the Mac come four superior external drives, pre-formatted and ready to boot your Mac and store multiple Megs of data. All support the full SCSI command set including Apple's UNIX system and LaserWriter NTX printer. There's even a built-in second SCSI connector for daisy-chaining.

SuperMac Tech. ... 30 day MBG
5452 Dataframe 20 \$589.
5447 Dataframe XP 30 699.
5448 Dataframe XP 60 959.
5449 Dataframe XP 100 1279.

A BETTER MOUSE PAD.



The world has been beating a path to Moustrak's door since the early days of the Mac. Their smooth, high-tech mouse pads provide sensitive mice with a surface suitable for slipping and sliding across your screen with the utmost precision. This elegant accessory suits the most discriminating Mac palate (or palette) and makes a wonderful gift for anyone who's been bitten by the Mac.

Moustrak ... 60 day MBG
Available in blue or gray.
2694 Moustrak Pad
(standard 7" x 9") \$8.
2692 Moustrak Pad (large 9" x 11") . 9.
2693 Moustrak Pad L/F (9" x 11") . 10.

MAY WE SLIP YOU SOME DISKS?



One of the first things that many of our customers say to themselves after placing an order is, "Oh my gosh, I forgot to order disks again. Well there's always next time." Sure, but what if you run out before next time? Hey, don't get caught short. We've got the **Sony 3 1/2" Disks** you need—and they could be in your hands tomorrow.

Sony ... 60 day MBG
3297 3 1/2" DS/DD Disks (10) \$14.
6148 3 1/2" DS/DD Disks-3 Pak (30) . 35.
3298 3 1/2" HD Disks-1.44 Meg (10) 25.

ULTIMATE DRIVING.



\$329

Upgrade any Mac and give it MS/DOS drive compatibility. Plug **Rapport** into your 512e, Plus, SE, or II's drive port to read 720K MS/DOS on your internal drive, or read/write MS/DOS on your external Apple 800K drive. With **Drive 2.4** plugged into Rapport, you can read and write all IBM and Mac 3.5 standards, plus 1.2 Meg or 2.4 Meg on HD disks. (SE/30, IIcx, IIci, and IIx users can use Drive 2.4 without Rapport.)

Kennet Technology ... 30 day MBG
5631 Rapport (incl. Fastback II) . \$199.
5632 Drive 2.4 329.
6150 Drive Port Cable
(for Mac II and IIx) 47.

GET SOME RELIEF.

Make you and your SE more comfortable. First, lift your papers out of the clutter and onto the **Universal Copy Stand**. Then, protect your eyes from glare, wear, and tear with the **Anti-Glare Filter**. Now, keep your SE, two peripherals, and modem calm with the **System Saver SE**. You get surge suppression, EMI/RFI noise filtering and front-mounted control switches. Get all three at this special price through 1/31/90.



\$95

Kensington ... 30 day MBG
6101 SE Bundle (Universal Copy Stand;
System Saver SE; Anti-Glare
Filter) special, all 3 for only \$95.

PROTECT YOUR INTERESTS.



\$75

Always keep your SE safely under wraps with the **Protection Pak**. On the road, use the **High Trek Travel Case**, featuring 3/4" high-density closed-cell foam, lined pockets, and a durable waterproof Cordura plus nylon skin. Keep up to 20 disks safely in the **Gallery Disk Easel**—designed to fold flat and fit into a pocket in the travel case. And, back home, cover your SE and keyboard with **MacAttire Dust Covers**, made from attractive, water-resistant, anti-static, washable rip-stop nylon.

Sopris Softworks ... 60 day MBG
4862 SE Protection Pak
(ext. keyboard) . . . special \$75.

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TRAVELLING SE OFFICE.

\$79



The Ultimate SE Carrying Case boasts two sturdy outside pockets for books, umbrellas, disks, pens, even 8 1/2" x 11" notebooks. Inside there's a padded compartment for your extended keyboard and a 9" x 9" padded pocket for mouse, cords, etc. The super-sturdy construction features a water-resistant Cordura shell, nickel-plated chromium steel hardware, and ultra high-density foam.

I/O Design ... 30 day MBG

6129 Ultimate SE Case ... special \$79.
2379 MacLuggage Imageware II ... 49.
2376 MacLuggage Macinware Plus ... 64.
2381 MacLuggage Macinware SE ... 75.

LABELS FOR ALL.

Avery Labels deliver guaranteed performance in Apple LaserWriter Plus and ImageWriter printers. They feed automatically from the paper tray and are available in address, shipping, file folder, and round sizes. New Laser Diskette Labels for 3 1/2" diskettes feature a special adhesive designed to stay on your disk and not peel off in your disk drive. Avery List&Mail Labels feature a special adhesive to prevent them from peeling off in your ImageWriter. They are available in individual use and bulk pack sizes.



Avery ... 60 day MBG

4865 Address (3 1/2" x 15 1/8" Qty. 3750) \$15.
4807 Laser (1" x 2 5/8" Qty. 3000) ... 24.
5392 Disk—Laser (3 1/2", Qty. 630) ... 29.
Call for other sizes.

PROTECT CLOTHES AND MAC.

Targus Carry Cases feature closed-cell foam and a special static-proof, water-resistant material that's strong as Cordura but softer so it won't wear out clothes. You also get 100 lb. tensile-strength shoulder straps and a sturdy padded bottom to cushion crash landings.



Targus ... 60 day MBG

3618 ImageWriter II Carry Case. \$45.
3617 Mac Plus/SE Carry Case ... 55.
4015 Mac SE & Extended Keyboard
Carry Case. 69.
6116 Mac IICx Carry Case. 85.

POWER THAT JUST WON'T QUIT.

\$269



Don't let spikes, sags, and surges smash your productivity. The 110SE UPS maintains continuous power for any Mac, including file-server units, protecting your data from both undervoltage and overvoltage. In an extended power outage, it can signal PowerChute, APC's software monitoring program, to automatically shut down your AppleShare (2.0 and up) networks. PowerChute comes free with the 110SE through 1/31/90.

American Power ... 30 day MBG

5895 110SE UPS 90 watts, 8 lbs., with free PowerChute ... special \$269.
6102 PowerChute (free with 110SE UPS through 1/31/90). 65.

FINE FLOPPY FURNITURE.

\$29



Part of our Mac mail order business is located in the old mill in Marlow, NH (pop. 561). So, it's not really any surprise that some of the old-timers around these parts still think that chips come from trees. In fact, to prove it, they've designed and hand-made the MacConnection Solid Oak Disk Case. It sports some solid New England craftsmanship and just-as-solid oak, and will hold 90 disks safely, securely, and in high style. Accept no substitutes.

MacConnection ... 60 day MBG

4623 Solid Oak Disk Case. \$29.

BE COOL.

**BE
CORDLESS.**



FannyMac QT can greatly extend your Mac's life. Its ultra-quiet fan reduces operating temperature, and it has a built-in surge protector to foil those spiteful spikes. Plus, it sits in your Mac's handle, so your Mac can still sit in its carrying case. The Mobius Mouse delivers super-fast and precise cordless cursor control. It's 100% compatible with all Mac hardware and software and doesn't require a special pad.

Mobius Technologies ... 60 day MBG

4470 Fanny Mac QT ... special \$55.
6126 Cordless Mouse ... special 95.

No Sales Tax.

MacConnection™

PRODUCT INDEX

Most products we carry are covered by 30-60 day Money Back Guarantees (as listed here in red). If you're not happy with one of these products, call us for an authorization and return it with all of the original packaging within the guarantee period for a refund or credit on your credit card. We reserve the right to limit quantities.

Version numbers in our ad are current at press time. We sell *only* the latest versions. Also, all software is not copy-protected, unless otherwise denoted by (CP). And finally, please refer to the four-digit number next to the product when ordering. Thanks!

ACCOUNTING & FINANCE

*Aatrix Software ... 30 day MBG		
5872	Checkwriter 2.0	special \$33.
3976	Aatrix Payroll 3.5	109.
3958	Aatrix Payroll PLUS 3.1	149.
*Chang Labs ... 60 day MBG		
1613	Rags to Riches Ledger 3.1	118.
1614	Rags to Riches Payables 3.1	118.
1617	Rags to Riches Receivables 3.1	118.
1622	Rags to Riches 3-Pak 3.1	289.
1612	Inventory Control 2.6	235.
1615	Professional Billing 2.9	235.
1616	Professional 3-Pak	355.
1618	Retail Business 3-Pak	355.
*CheckMark Software ... 60 day MBG		
5861	CashLedger 1.3A	119.
5862	Payroll 4.02	179.
5863	MultiLedger 1.3	239.
Computer Associates/Bedford		
4977	Simply Accounting 1.04	219.
*Dow Jones ... 30 day MBG		
1786	Market Manager PLUS 2.0	189.
*Intuit ... 30 day MBG		
2425	Quicken 1.5	36.
*Layered ... 30 day MBG		
5207	atOnce! 1.0	289.
2609	Insight Expert A/P 2.02	399.
2610	Insight Expert A/R 2.2	399.
2611	Insight Expert G/L 2.1	399.
2612	Insight Expert Inventory 1.01	399.
5643	Insight Expert Payroll 1.0	399.
2614	Insight Expert Time Billing 2.01	399.
6068	Insight Expert A/P, A/R, & G/L 3-Pak	999.
*MECA ... 60 day MBG		
2796	Managing Your Money 3.0	124.
*Monogram ... 30 day MBG		
2780	Dollars & Sense 4.1C	81.
*Niles & Associates ... 30 day MBG		
5101	Grant Manager 1.75	249.
*Nolo Press ... 60 day MBG		
2981	WillMaker 3.0	32.
*North Edge Software ... 30 day MBG		
2986	Timeslips III 1.1	169.
Satori		
3978	Components G/L	369.
6109	Components A/R	369.
SoftView		
3470	MacInTax	65.
*Survivor Software ... 30 day MBG		
6097	InvoicIt	50.
3289	MacMoney 3.5	special 55.

NUMBERS & DATABASES

*Abacus Concepts ... 60 day MBG		
4482	StatView SE + Graphics 1.03	179.
4481	StatView II 1.03	249.

5840	SuperANOVA 1.0 (for Mac Plus/SE)	\$439.
5904	SuperANOVA 1.0 (for Mac II)	439.
5906	SE + Graphics/SuperANOVA bundle	595.
5907	StatView II/SuperANOVA bundle	695.
*Acius ... 30 day MBG		
5618	4th Dimension 2.0	469.
4024	4th Dimension Runtime 2.0	229.
Blyth Software		
5492	Omnis 5	349.
5855	Omnis 5 (Additional 1 user)	75.
*BrainPower ... 60 day MBG		
1535	DesignScope 1.15	119.
1534	MathView Professional 1.1	129.
1537	StatView 512+ 1.2	149.
4066	The Analyzer Bundle (includes DataScan, DesignScope, and StatView 512+)	299.
*Bravo Technologies ... 30 day MBG		
1539	MacCalc 1.2D	79.
6084	MacCalc/SPAMM Bundle	115.
*Chang Labs ... 60 day MBG		
1611	C.A.T. 2.0	229.
Clarix		
4196	FileMaker II 1.1V2	225.
1125	MacProject II 2.0	375.
5910	FileMaker II & MacWrite II Bundle	299.
*Delta Point ... 60 day MBG		
6106	Trapeze	99.
*Fox Software ... 30 day MBG		
5572	FoxBASE II/Mac 2.0	295.
4580	FoxBASE +/Mac Runtime 2.0	179.
4844	FoxBASE +/Multi-User 2.0	399.
5579	FoxBASE +/Multi-User Runtime	295.
Individual Software		
4720	101 Macros for Excel 1.5	35.
Informix		
4955	Wingz 1.1	259.
*Microsoft ... 30 day MBG		
2866	File 2.0A	125.
2884	Works 2.0	185.
2865	Excel 2.2	249.
5454	The Microsoft Office	special 499.
*Nolo Press ... 60 day MBG		
4228	For the Record 1.03	28.
*Odesta ... 30 day MBG		
3014	GeoQuery 1.01	198.
4211	DataDesk Professional 2.0	285.
5621	Double Helix III	special 319.
Paracomp		
4664	Milo 1.0	158.
*Preferred Publishers ... 30 day MBG		
4780	Database 1.12	69.
*ProVUE ... 60 day MBG		
4582	Panorama 1.1.1	199.
*Rubicon Publishing ... 60 day MBG		
3272	Dinner At Eight-Encore Edition (CP)	45.
Satori		
3320	BulkMailer 3.25	78.
3321	BulkMailer Plus 3.25	189.
*Softstream Int'l., Inc. ... 60 day MBG		
5439	Endeavour Planner 1.0	95.
*Synergy ... 30 day MBG		
3129	KaleidaGraph 2.0	145.

GRAPHICS & DESIGN

Altsys		
1194	FONtastic Plus 2.02	51.
5425	Art Importer 2.0	92.
Bright Star Technology		
3962	HyperAnimator 1.5	99.
Broderbund Software		
4065	PosterMaker Plus 2.5B	35.
1427	Print Shop 1.3	35.
*Casady & Greene ... 60 day MBG		
1575	Fluent Fonts 2.0	27.

Clarix		
1123	MacPaint II 2.0	\$95.
1117	MacDraw II 1.1	295.
5911	MacDraw II & MacWrite II Bundle	369.
4815	Smart Form Designer 1.01V	295.
4814	Clarix CAD 1.0	595.
Computer Associates/Cricket		
1667	Cricket Draw 1.1.1	special 139.
*DeltaPoint ... 60 day MBG		
6095	DeltaGraph	99.
*Deneba Software ... 30 day MBG		
1769	Canvas 2.0	169.
*DreamMaker ... 30 day MBG		
4088	MacGallery (MacPaint format)	27.
Dubl-Click Software		
3972	World-Class Fonts! Originals	42.
3973	World-Class Fonts! Stylish	42.
3974	World-Class Fonts! Giants	42.
5131	World-Class Fonts! Triples	42.
<i>MacConnection carries the entire line of WetPaint Clip-Art.</i>		
<i>Volumes 1 & 2 thru 17 & 18 ... each 42.</i>		
*Electronic Arts ... 30 day MBG		
5289	Studio/1 1.0	97.
4315	Studio/8 1.0	299.
*Emerald City ... 30 day MBG		
5168	Smart Art I 1.0	85.
5602	Smart Art II 1.0	85.
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*Enabling Technologies ... 30 day MBG		
1871	Pro3D 1.2	279.
<i>Clip 3D (8 clip-art pkgs.) special ea. 49.</i>		
Enzan-Hoshigumi USA		
1879	MacCalligraphy 2.0	99.
*Generic Software ... 60 day MBG		
4319	Generic CADD Level 1 1.1	84.
*Good Software ... 30 day MBG		
5428	NuPaint 1.0.4	special 79.
*Graphsoft ... 30 day MBG		
4993	MiniCad + 2.0V4	519.
*Great Wave ... 30 day MBG		
2272	Crystal Paint 1.0	special 25.
Innovative Data Design		
2417	MacDraft 1.2B	special 135.
4707	Dreams 1.0	special 249.
*Linguist's Software ... 60 day MBG		
<i>Over 100 language fonts ... call</i>		
2630	Greek	special 49.
2636	Kanji 6.0	special 49.
2645	Chinese Mandarin	special 69.
2641	LaserHebrew	special 69.
*MacroMind ... 30 day MBG		
4953	VideoWorks II 2.0	175.
4952	VideoWorks II HyperCard Driver 1.2	60.
4954	VideoWorks II Accel. 1.1	special 99.
6159	MacroMind Accelerator	129.
5087	MacroMind Director 1.0	445.
*MicroMaps ... 30 day MBG		
5516	MacAtlas (Paint version)	45.
5514	MacAtlas (EPSF version)	105.
5513	MacAtlas (Professional version)	105.
5515	MacAtlas Presentation Pack	105.
Mindscape		
5768	ZING 1.0	125.
Paracomp		
4597	Swivel 3D 1.1	299.
*Silicon Beach ... 60 day MBG		
3506	SuperPaint 2.0	125.
3980	Digital Darkroom 1.1	249.
3507	Super3D 2.0	315.
*Solutions Int'l. ... 60 day MBG		
3446	The Curator 1.05	72.
*SuperMac Software ... 60 day MBG		
3380	PixelPaint 2.0	225.
5625	PixelPaint Professional 1.0	395.

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★T/Maker ... 30 day MBG		
3632	ClickArt Business Images	\$28.
3636	ClickArt Holidays	28.
3633	ClickArt Christian Images	35.
3G Graphics		
3942	Images with Impact: Graphics 1	51.
4583	Images with Impact: Business 1	65.
★Zedcor ... 60 day MBG		
3986	DeskPaint & DeskDraw 2.01	65.

PUBLISHING & PRESENTATIONS

Adobe Systems		
5750	Adobe Type Manager	56.
6053	Adobe Plus Pack	109.
6156	Adobe ATM/Plus Pack Bundle	162.
1138	The Collector's Edition	79.
4816	The Collector's Edition II	129.
5001	StreamLine 1.0	229.
5605	True Form 2.0	225.
5606	True Form FillOut 2.0	169.
1137	Adobe Illustrator '88 1.9	279.
1142	Newsletters/Publishing Pack 1	229.
4565	Forms and Schedules Pack 2	279.
4566	Presentations Pack 3	279.
<i>MacConnection carries the entire Adobe Type Library.</i>		
Volumes 1-122		call
★Aldus ... 30 day MBG		
4751	Persuasion 2.0	339.
1330	Freehand 2.02	345.
1331	PageMaker 3.02	385.
6149	PageMaker Color Extension	149.
Altsys		
1195	Fontographer 3.0	249.
★Antic Software ... 30 day MBG		
5756	FlexForm Business Templates I	49.
5760	FlexForm Business Templates II	49.
Bitstream		
MacFontware Typeface pkgs. ea.		89.
Brightstar Tech.		
6096	Alphabet Blks & Talking Tiles	45.
6093	Interface 1.0	229.
★Casady & Greene ... 60 day MBG		
4839	Vivid Impressions	67.
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Volumes 1-22		each 46.
4838	Quill Pack (Vol. 8 & 20)	89.
4836	Headline Pack (Vol. 10-12)	125.
4837	Modern Pack (Vol. 7, 14-18)	159.
4834	Distinctive Pack (Vol. 8, 19-22)	159.
4833	Classic Pack (Vol. 3-6, & 13)	159.
Computer Associates/Cricket		
1668	Cricket Graph 1.3	115.
1670	Cricket Presents 2.0	285.
★DreamMaker ... 30 day MBG		
4840	Cliptures: Business 1	69.
4841	Cliptures: Business 2	69.
Dubl-Click Software		
World-Class LaserType Vol. 1-9 ea.		42.
★Farallon Computing ... 30 day MBG		
4684	ScreenRecorder 1.0	129.
2199	MacRecorder 2.0	162.
ICOM Simulations		
5682	MacKern 1.0	115.
Letraset		
2621	Ready, Set, Go! 4.5	275.
2619	Image Studio 1.5	275.
4709	LetraStudio 1.0	275.
Mansfield Systems		
5892	TableTools 1.0	269.
★Microsoft ... 30 day MBG		
2878	PowerPoint 2.01	249.
★Postcraft Int'l. ... 60 day MBG		
3157	Laser FX 1.7	99.
★Preferred Publishers ... 30 day MBG		
5751	Exposure 1.1	54.

Quark		
4621	QuarkStyle 1.0	\$169.
3230	Quark XPress 2.11	459.
★Softstream Int'l., Inc. ... 60 day MBG		
4996	UltraSpec 1.0	95.
★Springboard ... 30 day MBG		
3530	Certificate Maker 2.0	22.
3532	Certificate Library	18.
4497	Top Honors 1.01	59.
4500	Springboard Publisher II	special 89.
★Timeworks ... 30 day MBG		
5908	Publish-it! 1.0	225.
★T/Maker ... 30 day MBG		
3635	EPS Illustrations	74.
5167	EPS Business Art	74.

PROGRAMMING & HYPERMEDIA

★Antic Software ... 30 day MBG		
6100	HOT-SPOT	42.
★Beacon Technology ... 30 day MBG		
4967	HyperBible (King James) 1.0	145.
4968	HyperBible (New International) 1.0	175.
Borland International		
1511	Turbo Pascal 1.1	68.
1512	Turbo Pascal Tutor 1.0	46.
Broderbund Software		
5237	Whole Earth Catalog (CD ROM)	89.
★Digitalk ... 60 day MBG		
5166	SmallTalk/V Mac 1.1	129.
★DreamMaker ... 30 day MBG		
4115	MacGallery (HyperCard format)	27.
ICOM Simulations		
5681	HyperTMON 1.0	59.
4085	TMON 2.8.2	89.
Individual Software		
4719	101 Scripts & Buttons Hypercard 1.0	36.
★Manx Software ... 60 day MBG		
4317	Aztec SDB	63.
4316	Aztec C UniTools	63.
4069	Aztec MPW C 3.6B	95.
4075	Aztec C + SDB 3.6B	95.
★MicroMaps ... 30 day MBG		
5512	HyperAtlas	59.
5518	QuickMap	59.
★Microsoft ... 30 day MBG		
4471	QuickBasic 1.0	65.
★Millenium Software ... 30 day MBG		
6105	Hyper X	65.
Olduvai		
5446	PLUS 1.11	special 95.
★Silicon Beach ... 60 day MBG		
5100	SuperCard 1.0	125.
★SmethersBarnes ... 30 day MBG		
1478	Prototyper 2.1	169.
★Softstream Int'l., Inc. ... 60 day MBG		
5440	HyperHIT 1.0	125.
★Somak Software ... 30 day MBG		
5897	ScriptEdit 1.1	49.
★Springboard ... 30 day MBG		
4495	Family Matters 1.0	28.
★Symantec ... 30 day MBG		
4644	Just Enough Pascal 1.0	47.
3421	THINK Pascal 2.0	85.
3420	THINK C 4.0	149.
★Symmetry ... 30 day MBG		
3318	HyperDA 1.2	special 47.
★Timeworks ... 30 day MBG		
5905	The Hyperworks Organizer 1.0	57.
★TML Systems ... 30 day MBG		
3548	TML Source Code Library II 1.1	39.
4989	TML Pascal II 3.0 (w/o MPW 3.0)	57.
3549	TML Pascal II 3.0 (w/MPW 3.0)	109.
Trendware		
5203	Stack Cleaner	29.
5202	HyperTools #1 1.02	special 47.
5199	HyperTools #2 1.04	special 47.
5609	XCAL 1.0	79.

True BASIC, Inc.		
3587	True BASIC 2.01	\$55.
★Zedcor ... 60 day MBG		
3985	ZBASIC 5.0	89.

UTILITIES

★Abbott Systems ... 30 day MBG		
5236	CanOpener 1.1	65.
★Affinity Microsystems ... 60 day MBG		
1014	Affinifile 1.1	45.
1016	Tempo II 1.02 w/template	75.
★Aladdin Systems ... 30 day MBG		
6169	Shortcut	46.
★American Power ... 30 day MBG		
6102	Power Chute	65.
★Berkeley Systems ... 30 day MBG		
5737	After Dark 1.0	special 22.
1541	Stepping Out II 2.01	special 45.
★Bravo ... 30 day MBG		
5404	SPAMM 1.1	48.
★Casady & Greene ... 60 day MBG		
2269	QuickDEX 1.4A	31.
★CE Software ... 60 day MBG		
4689	MockPackage Plus Utilities 4.4	32.
1728	DiskTop 4.0	64.
1729	QuickKeys 1.2	64.
★Central Point ... 30 day MBG		
5040	Copy II Mac 7.2	24.
5041	MacTools Deluxe 1.0	75.
Connectix		
6123	Virtual 2.0 (for SE/30, Ilcx, Ilx, & Ilci)	125.
6122	Virtual 2.0 (for Mac II, incl. PMMU)	195.
★Dantz Development ... 30 day MBG		
5255	Retrospect 1.1	152.
Dubl-Click Software		
1824	Calculator Construction Set 2.01	46.
★Electronic Arts ... 30 day MBG		
1843	Disk Tools Plus 1.01 (Batteries Incl.)	31.
★Fifth Generation ... 60 day MBG		
4287	PYRO! 3.3 (screen saver)	14.
3955	Suitcase II 1.2.3	44.
5178	FastBack II 2.0	107.
5725	DiskLock 1.0	108.
★HJC Software ... 30 day MBG		
4803	Virex 2.1	55.
5885	Virex 2.1 (10 Pack)	349.
ICOM Simulations		
4084	On Cue 1.3	35.
★Insight Development ... 30 day MBG		
6171	MacPrint	95.
★JAM Software ... 30 day MBG		
6089	Smart Alarms Single User	49.
6088	Smart Alarms 1-4 Users	99.
6087	Smart Alarms 5-8 Users	149.
6086	Smart Alarms 9-15 Users	199.
6085	Smart Alarms 16-25 Users	299.
★Kent Marsh Ltd. ... 30 day MBG		
5457	QuickLock 1.0	57.
2591	The NightWatch 1.03	87.
6134	MacSafe II	107.
★Loop Software ... 30 day MBG		
5442	PictureBook	39.
MEDIAGENIC		
4591	Open It! 1.0	49.
★Microlytics ... 60 day MBG		
2732	GOFer 2.0	45.
★Microseeds Pub. ... 60 day MBG		
4848	INITPicker 1.0	27.
4210	Screen Gems 1.0	39.
2913	Redux 1.5	special 46.
Olduvai Software		
4503	MultiClip 1.01	50.
★Software Innovations ... 30 day MBG		
5869	HandOff	special 29.
★Solutions Int'l. ... 60 day MBG		
3448	SmartScrap & The Clipper 2.1	45.
3449	SuperGlue II 2.0	61.

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*SuperMac Software ... 60 day MBG		
3383	SuperSpool 5.0	\$58.
3382	SuperLaserSpool 2.0	88.
3378	SuperLaserSpool 5-Pack 2.0	295.
3377	DiskFit 1.5	58.
3379	Network DiskFit 1.5	225.
3381	Sentinel 2.0	87.
*Symantec ... 30 day MBG		
5176	Symantec Anti-virus for Mac 1.1	63.
5724	Symantec Utilities II for Mac	95.
*Synex ... 30 day MBG		
6173	MacEnvelope 4.1	65.
*Williams & Macias ... 30 day MBG		
3779	DiskFinder	27.
3783	myDiskLabeler w/Color 2.9.1I	28.
3784	myDiskLabeler w/LaserWriter 2.9.1LI	33.
3780	ImageWriter II Label Pack (Qty. 216)	15.
3781	LaserWriter Label Pack (Qty. 216)	18.
4976	Sticky Business 1.0.7	special 79.
*XTree ... 30 day MBG		
5177	XTreeMac 1.02	52.

WORD PROCESSING

A Lasting Impression		
5465	ResumExpert	special 35.
5749	Cover Letters	special 35.
5853	Sales & Marketing	special 35.
5852	Management Edition	special 35.
*Advanced Software ... 30 day MBG		
5608	DocuComp 1.11	89.
Ashton-Tate		
1324	FullWrite 1.1	259.
Claris		
1129	MacWrite II	185.
*DeltaPoint ... 60 day MBG		
6108	Mind Write	59.
6107	Mind Write Express	79.
*Deneba Software ... 30 day MBG		
4700	BigThesaurus 1.0	59.
1767	Comment 2.0	59.
1768	Coach Professional 3.0C	115.
*Electronic Arts ... 30 day MBG		
1543	Thunder II 1.01 (Batteries Included)	49.
*Microlytics ... 60 day MBG		
2733	Word Finder 2.0	34.
4870	Electronic WordFinder 220	69.
*Microsoft ... 30 day MBG		
2885	Write 1.0	79.
4969	Word 4.0	249.
*Niles & Associates ... 30 day MBG		
5048	EndLink 1.0	58.
4602	EndNote 1.2.1	75.
*Paragon Concepts ... 30 day MBG		
5683	Nisus 2.03	special 225.
*Preferred Publishers ... 30 day MBG		
4781	Vantage 1.1	54.
*Sensible Software ... 30 day MBG		
3375	Sensible Grammar 1.5.5	special 51.
4692	Bookends 1.1.7	special 51.
*Symantec ... 30 day MBG		
3422	More II 2.01	245.
*Symmetry ... 30 day MBG		
4504	Acta Advantage 1.0	special 64.
*T/Maker ... 30 day MBG		
3639	WriteNow 2.0 (w/Personal Graphics)	99.
*WordPerfect ... 60 day MBG		
3800	WordPerfect Mac 1.0.2	185.
*Working Software ... 30 day MBG		
3790	Lookup 1.0C	30.
3788	Findswell 2.0	36.
3792	Spellswell 2.0G	45.
4699	QuickLetter 1.01	73.

MUSIC & EDUCATION

*Ars Nova ... 60 day MBG		
1215	Practica Musica 2.1	72.

*Bogas Productions ... 60 day MBG		
1461	Studio Session 1.2 SE	\$45.
4255	Super Studio Session 2.0	65.
6135	Super Studio Session Bundle Pak (w/Heavy Metal Rock, String Quartet, Country, Brass, & Sound Effects)	99.
Bright Star Technology		
3961	Talking Tiles 1.0	27.
1402	Alphabet Blocks 1.0	30.
6096	Talking Tiles/Alph. Blocks Bundle	45.
Broderbund Software		
4314	Type! 1.0	19.
1423	Jam Session 1.1 (CP)	29.
1422	Geometry 1.2 (CP)	58.
4067	Calculus 1.2 (CP)	58.
1426	Physics 1.2 (CP)	58.
Carina Software		
5726	Voyager 1.2	89.
Coda Music Systems		
4367	MacDrums 1.01 (CP)	31.
4483	Perceive 1.0	49.
5854	MusicProse 1.0	169.
5604	Finale 1.2.6	399.
Davidson & Associates		
1734	Math Blaster! 1.0 (CP)	27.
6128	Math Blaster Mystery (CP)	27.
4978	Speed Reader II 1.0 (CP)	27.
*Electronic Arts ... 30 day MBG		
4619	Mavis Beacon Typing 1.2B (CP)	32.
1846	Deluxe Music Construction Set 2.5	84.
*First Byte ... 30 day MBG		
5294	Puzzle Storybook 1.0 (ages 3-8)	27.
5293	Dinosaur Discovery Kit 1.0 (ages 3-8)	27.
3941	SmoothTalker 2.1	32.
3936	KidTalk 2.0 (ages 5-15)	32.
3940	First Shape 2.0 (ages 3-8)	32.
3935	Speller Bee 2.0 (ages 5-12)	32.
*Great Wave ... 30 day MBG		
2276	KidsTime 1.2 (ages 3-8)	26.
5642	KidsMath 1.1 (ages 3-8)	26.
4334	NumberMaze 1.1 (ages 5-12)	26.
2271	ConcertWare + MIDI 5.0	99.
*Learning Company ... 30 day MBG		
2670	Reader Rabbit 2.1 (CP)(ages 4-7)	31.
5453	Talking Math Rabbit 1.0 (ages 4-7)	31.
*Paragon Concepts ... 30 day MBG		
6094	Mac Tag	42.
*Penton Overseas ... 30 day MBG		
5864	VocabuLearn/ce French (level 1)	30.
5887	VocabuLearn/ce French (level 2)	30.
5865	VocabuLearn/ce Italian (level 1)	30.
5889	VocabuLearn/ce Italian (level 2)	30.
5867	VocabuLearn/ce Spanish (level 1)	30.
5891	VocabuLearn/ce Spanish (level 2)	30.
5868	VocabuLearn/ce German (level 1)	30.
5888	VocabuLearn/ce German (level 2)	30.
5866	VocabuLearn/ce Japanese (level 1)	36.
5890	VocabuLearn/ce Japanese (level 2)	36.
*Personal Training Sys. ... 60 day MBG		
<i>Excelerate 2.2 Training Series</i>		
5573	XL1 Beginning Spreadsheets	39.
5574	XL2 Intermediate Spreadsheets	39.
5575	XL3 Advanced Spreadsheets	39.
5576	XL4 Creating Business Graphics	39.
6021	XL5 Building Databases	39.
6020	XL6 Beginning Micros	39.
<i>MacTeach Training Series</i>		
5263	B1 The Basics (for 2 floppy drives)	39.
5264	B2 The Basics (for Plus or SE w/HD)	39.
5265	B3 The Basics (for Mac II w/HD)	39.
5266	B4 Beyond the Basics	39.
<i>LearnWord Training Series</i>		
4947	W1 Beginning Level	39.
4854	W2 Intermediate Level	39.
5098	W3 Advanced Level	39.
5418	W4 Additional Features	39.
<i>LearnPersuasion Training Series</i>		
5269	LP1 Beginning Persuasion	39.

5270	LP2 Intermediate Persuasion	\$39.
5271	LP3 Creating AutoTemplates	39.
5272	LP4 Creating Artwork	39.
<i>HyperEasy Training Series</i>		
5194	H1 Using HyperCard	39.
5195	H2 Creating Cards & Stacks	39.
5267	H3 Basic Scripting	39.
5268	H4 Advanced Scripting	39.
<i>PageTutor Training Series</i>		
4852	P1 Beginning PageMaker	39.
4853	P2 Intermediate PageMaker	39.
5096	P3 Tips & Techniques	39.
5097	P4 Advanced Features	39.
<i>MasterWorks Training Series</i>		
5196	M1 Database & Form Letters	39.
5197	M2 Advanced Databases	39.
5273	M3 Spreadsheets	39.
5274	M4 Word Processing	39.
<i>Learn88 Training Series</i>		
5259	A1 Beginning Illustrator	39.
5260	A2 Intermediate Illustrator	39.
5261	A3 Creating Special Effects	39.
5262	A4 Precision Drawing Techniques	39.
<i>Learn FileMaker Training Series</i>		
5278	FM1 Beginning FileMaker	39.
5279	FM2 Intermediate FileMaker	39.
5280	FM3 Advanced FileMaker	39.
5281	FM4 Tips & Techniques	39.
*Spinnaker ... 30 day MBG		
2329	SAT Score Improvement 1.0 (CP)	57.
*Springboard ... 30 day MBG		
4493	Atlas Explorer (CP)	28.
True BASIC, Inc.		
3571	Algebra (with workbook)	39.
3580	Pre-Calculus (with workbook)	39.
3575	Calculus (with workbook)	39.
6110	Algebraic Proposer	45.
*Unicorn ... 30 day MBG		
3751	Animal Kingdom (CP)(ages 6-12)	27.
3756	Math Wizard (CP)(ages 5-10)	27.
3755	MacRobots (CP)(ages up to 6)	27.
3754	Read-A-Rama (CP)(ages 5-8)	32.

ENTERTAINMENT

Access Software		
4655	World Class Leader Board Golf	26.
Activision		
4475	Quarterstaff (CP)	29.
4486	Manhole	30.
5127	Manhole (CD ROM)	35.
5517	Cosmic Osmo	42.
Broderbund Software		
5886	Star Wars (CP)	24.
4099	Shufflepuck Cafe (CP)	24.
1421	Ancient Art of War (CP)	26.
4540	Ancient Art of War at Sea (CP)	26.
4229	Where/World Carmen Sandiego? (CP)	27.
5755	Where/Europe Carmen Sandiego? (CP)	29.
5233	Where/USA Carmen Sandiego? (CP)	29.
4966	SimCity 1.1 (CP)	29.
5871	SimCity Supreme (CP)	48.
*Bull City Software ... 30 day MBG		
5841	Moriarty's Revenge	32.
Bullseye		
1545	Fokker Triplane 2.02 (CP)	24.
1544	Ferrari Grand Prix (CP)	32.
4074	P51 Mustang Flight Simulator (CP)	32.
*Casady & Greene ... 60 day MBG		
2268	Crystal Quest 2.2T	25.
4119	Crystal Quest w/Critter Editor 2.2T	41.
*Discovery Software ... 30 day MBG		
4408	Arkanoid	26.
*Electronic Arts ... 30 day MBG		
1850	Reach for the Stars	26.
5554	Bard's Tale	32.
4064	Chuck Yeager Flight Simulator	32.
4588	Life & Death (CP)	32.

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4945	The Hunt for Red October	\$32.
4981	Starfleet 1	36.
	Infocom	
5814	Journey	29.
5816	Shogun	35.
4592	Zork Zero (CP)	35.
5815	Zork Zero (for the Mac II)	35.
	*Inline Design ... 30 day MBG	
5870	Bomber (includes headphones)	26.
	MicroProse	
4697	Pirates! (CP)	35.
	*Microsoft ... 30 day MBG	
2868	Flight Simulator (CP)	33.
	Miles Computing	
5253	The Puzzle Gallery	27.
2765	Fool's Errand	32.
2767	Harrier Strike Mission II (CP)	32.
	Mindscape	
4083	Balance of Power 1990 (CP)	29.
3987	Colony (CP)	29.
4596	Deja Vu II (CP)	29.
2743	Crossword Magic (CP)	29.
2749	Shadowgate (CP)	29.
5252	Gauntlet (CP)	29.
2751	Uninvited (CP)	29.
	Premier Technology	
5773	Strategic Conquest Plus 2.0	34.
5774	NetTrek-The Real Version	34.
	Sierra On-Line	
4161	Mother Goose (CP)	19.
3397	Leisure Suit Larry (CP)	23.
5694	Manhunter: San Francisco (CP)	29.
3394	King's Quest (CP)	29.
3395	King's Quest II (CP)	29.
3396	King's Quest III (CP)	29.
3398	Police Quest (CP)	29.
3399	Space Quest (CP)	29.
3400	Space Quest II (CP)	29.
	*Silicon Beach ... 60 day MBG	
3502	Beyond Dark Castle	special 24.
3501	Apache Strike	special 24.
3503	Dark Castle	special 24.
	*Softstream Int'l., Inc. ... 60 day MBG	
4071	MacMan	23.
4072	The Solitaire DA	23.
4995	Cribbage Tutor	26.
4073	Colour Billiards	38.
	*Software Toolworks ... 30 day MBG	
1842	Chessmaster 2100 (CP)	32.
6111	Cribbage King-Gin King	39.
	*Spectrum Holobyte ... 30 day MBG	
4175	Solitaire Royale (for Mac SE)	19.
4001	Solitaire Royale (for Mac II)	19.
3464	Tetris	19.
6112	Welltris	19.
4472	Tetris (color version)	24.
3462	PT-109	26.
3460	GATO	26.
3459	Falcon 2.0	31.
	*Spinnaker ... 30 day MBG	
2328	Sargon IV (CP)	29.
	*Springboard ... 30 day MBG	
4988	Hidden Agenda	36.
	*SubLogic ... 60 day MBG	
4698	Jet (CP)	32.
6113	Jet & QuickStick	special 59.
6138	Jet & QuickStick ADB	special 69.
	XOR	
6152	TaskMaker (CP)	27.
4321	Lunar Rescue (CP)	34.
4517	Road Racer (CP)	39.
4320	MacGolf Classic (CP)	53.
3815	NFL Challenge (CP)	57.

NETWORKS & COMMUNICATIONS

	*Abaton ... 30 day MBG	
4589	InterFAX Modem	269.

	*CE Software ... 60 day MBG	
5817	QuickMail Remote	\$33.
5174	QuickMail (5 user Pak)	169.
5173	QuickMail (10 user Pak)	249.
5636	In/Out (5 user Pak)	129.
5638	In/Out (10 user Pak)	189.
	*CompuServe ... 60 day MBG	
1676	CompuServe Information Service	24.
1673	CompuServe Navigator 2.1. special	39.
1674	Standard Service/Navigator Bundle	59.
	Connect, Inc.	
5834	Connect 1.5 for the Macintosh	95.
	*DataViz ... 60 day MBG	
1823	MacLink Plus/PC 4.1	125.
4842	MacLink Plus/Translators 4.1	99.
	*Dove Computer ... 60 day MBG	
4939	FastNet III	375.
4938	FastNet SE	375.
5624	FastNet SE/30	375.
4937	FastNet SCSI	749.
	*Dow Jones ... 30 day MBG	
5295	News/Retrieval Membership Package	24.
1785	Desktop Express 1.03	95.
	*Farallon Computing ... 30 day MBG	
5707	Timbuktu 3.0	95.
4866	Timbuktu Remote 1.0.1	129.
4867	Timbuktu 30-Pack 3.0	1325.
2201	TrafficWatch 1.08	129.
5664	PhoneNET StarConnector	21.
2203	PhoneNET PLUS (DIN-8)	33.
2204	PhoneNET PLUS (DB-9)	33.
5251	PhoneNET CheckNET	65.
4869	PhoneNET Connector 10-Pack	215.
4868	PhoneNET Repeater	319.
2206	PhoneNET StarController	829.
5893	Portable Pack (incl. two copies each of Timbuktu & Timbuktu Remote, two StarConnectors, and accessories)	375.
	*Freesoft ... 60 day MBG	
6115	White Knight 11	89.
	Hayes	
2300	Smartcom II 3.1A	87.
2307	Smartmodem 2400	429.
5991	V9600 Baud Modem	759.
	Insignia Solutions	
4089	SoftPC 1.3	245.
	Intel Corporation	
5119	2400 Baud External Modem	179.
	*Microsoft ... 30 day MBG	
5858	Microsoft Mail 2.0 Workstation	84.
5856	Microsoft Mail 2.0 Server	249.
5857	Microsoft Mail 2.0 (20 Pack)	969.
	*Nuvotech ... 60 day MBG	
3000	TurboNet ST (DIN-8)	30.
3001	TurboNet ST (DB-9)	30.
5277	TurboBridge	319.
	*Practical Peripherals ... 30 day MBG	
3100	1200 Baud External Modem	77.
3102	2400 Baud External Modem	179.
3089	Mac Communications Pack 1.5	199.
5285	PM 2400SA MNP Modem	209.
	*Shiva ... 30 day MBG	
3444	NetSerial X232	279.
4347	NetBridge	339.
4942	TeleBridge	339.
3443	NetModem V2400	439.
	*Software Ventures ... 30 day MBG	
3455	MicroPhone II 3.0	219.
	*Solutions Int'l. ... 60 day MBG	
4308	BackFAX (reqs. Apple FAX modem)	124.
	*Synergy ... 30 day MBG	
3130	VersaTerm 4.0	89.
3131	VersaTerm-PRO 3.0	175.
	*TOPS ... 30 day MBG	
4188	TOPS Teleconnector (DIN-8)	29.
4189	TOPS Teleconnector (DB-9)	29.
3726	TOPS for DOS 2.1	114.
4598	TOPS FlashBox	123.

3725	TOPS Repeater	\$125.
3723	TOPS Mac 2.1	137.
3720	TOPS Flashcard	159.
3724	NetPrint 2.0	115.
4714	InBox Starter Kit 2.2	149.
4715	InBox Connection Mac 2.2	45.
	*Traveling Software ... 60 day MBG	
3729	LAP-LINK Mac 2.0	81.

INPUT/OUTPUT

	*American Power ... 30 day MBG	
5895	110SE UPS (w/free PowerChute)	269.
	Caere	
4476	OmniPage 2.0	549.
	*CoStar ... 30 day MBG	
6067	LabelWriter Labels	11.
6090	LabelWriter	189.
6091	The Organizer	239.
	*Cutting Edge ... 30 day MBG	
3988	CE 105ADB Keyboard w/QuickKeys	135.
	*Datadesk ... 30 day MBG	
1818	HyperDialer	29.
1819	MAC-101 Keyboard (beige)	139.
1820	MAC-101 Keyboard (platinum)	139.
1821	MAC-101 Keyboard (ADB)	139.
	Foreign keyboards available in French, German, Spanish, and the U.K. call	
	*GDT Softworks ... 30 day MBG	
6151	JetLink Express	89.
	*Kensington ... 30 day MBG	
2576	Turbo Mouse for Mac Plus 3.0	109.
2547	Turbo Mouse ADB 3.0	109.
	Koala	
2593	MacVision 2.0	219.
	*Kraft Systems ... 60 day MBG	
2600	3-Button QuickStick	39.
4082	3-Button QuickStick ADB	49.
6099	ADB Trackball (with foot pedal)	79.
	*Logitech ... 30 day MBG	
5082	ScanMan Mac	325.
	*LYNX Computer ... 30 day MBG	
1211	LYNX Trackball	59.
1212	LYNX Trackball ADB	59.
	*Microseeds Pub. ... 60 day MBG	
4843	WristMac 1.0	145.
5018	WristMac Executive 1.0	189.
	*Mobiis Technologies ... 60 day MBG	
6126	Cordless Mouse	special 99.
4846	MultiScreen	315.
	*Mouse Systems ... 30 day MBG	
2808	A+ Mouse	59.
2809	A+ Mouse ADB	79.
	*Nutmeg Systems ... 30 day MBG	
2993	15" Monitor for Mac II	799.
2992	15" Monitor for Mac Plus	999.
2994	15" Monitor for Mac SE	999.
4002	19" Monitor for Mac Plus	special 1195.
4096	19" Monitor for Mac SE	special 1195.
5680	19" Monitor for Mac SE/30	special 1195.
4097	19" Monitor for Mac II	special 1195.
	Olduvai Software	
5138	Read-It! OCR Personal 2.1	125.
3034	Read-It! OCR 2.1	245.
	*Orange Micro ... 30 day MBG	
4488	Grappler Spooler	38.
3036	Grappler C/Mac/GS 2.0	78.
4487	Grappler LS 1.0	103.
	*PTI/DataShield ... 30 day MBG	
5254	MacDirector	109.
	Summagraphics	
4298	BitPad Plus ADB	319.
	TheComplete PC	
6104	TheComplete Half-Page Scanner/400	315.
6103	TheComplete Page Scanner	759.
	*Thunderware ... 30 day MBG	
3648	ThunderScan 5.0 with PowerPort	187.

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4994	LightningScan	\$369.
3645	Mac II Power Accessory	45.

MEMORY & DRIVES

1 Meg SIMMs

1107	Low profile 80 nanoseconds SIMMs at the best prices. 2 year warranty.	99.
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★Cutting Edge ... 30 day MBG

3989	800k External Disk Drive (platinum)	149.
5133	20 Meg Hard Drive	439.
3990	30+ Meg Hard Drive	499.
3991	45+ Meg Hard Drive	549.
5275	65+ Meg Hard Drive	629.
5276	80+ Meg Hard Drive	739.
5456	44 Meg Removable Drive	889.
5736	44 Meg Removable Cartridge	115.

★Dove Computer ... 60 day MBG

1802	Dove Tool Kit	15.
1801	SCSI Interface/Port	109.
5879	MacThon Serial/Parallel	195.
1807	MacSnap 524E	185.
1809	MacSnap 524S	239.
1811	MacSnap 548E	419.
1812	MacSnap 548S	479.
1800	MacSnap 2SE	319.
1797	MacSnap Plus 2	319.
1804	MacSnap 2S	209.
1805	MacSnap 4S	409.

ACCELERATOR BOARDS

1793	MaraThon 020 MSE1	429.
1794	MaraThon 020 MSE2 (1 Meg)	699.
1795	MaraThon 020 MSE3 (math chip)	589.
1796	MaraThon 020 MSE4 (1 Meg/chip)	879.
5192	MaraThon 020 MSE5 (4 Meg)	879.
5193	MaraThon 020 MSE6 (4 Meg/chip)	1099.
4663	MaraThon 030 Accelerator 32 MHz	969.
5878	MaraThon 030x Accelerator	969.
5880	MaraThon 030 SE/30 Accelerator	969.
5623	MaraThon Racer	149.
ACCELERATORS (020) WETHERNET		
5391	FastNet LAN 1	1125.
5390	FastNet LAN 2 (1 Meg)	1499.
5389	FastNet LAN 3 (math chip)	1349.
5388	FastNet LAN 4 (1 Meg/chip)	1724.
5387	FastNet LAN 5 (4 Meg)	1499.
5386	FastNet LAN 6 (4 Meg/chip)	1729.

Epson

5132	40 Meg Raw Drive (25ms)	399.
5204	70 Meg Raw Drive (25ms)	499.

IOmega

5552	44M Ext. Single Bernoulli II Drive	1399.
5553	44M Ext. Dual Bernoulli II Drive	2199.

★Kenneth Tech. ... 30 day MBG

5631	Rapport (includes FastBack II)	199.
5632	Drive 2.4	329.

★SuperMac Tech. ... 30 day MBG

SuperMac drives include SuperSpool, SuperLaserSpool, Disklit and Manager		
5452	Dataframe 20	589.
5447	Dataframe XP 30	699.
5448	Dataframe XP 60	959.
5449	Dataframe XP 100	1279.

STORAGE MEDIA

★Verbatim ... 60 day MBG

3772	3 1/2" DS/DD Disks (10)	15.
3773	3 1/2" HD Disks 1.44 Meg (10)	29.

★Sony ... 60 day MBG

3297	3 1/2" DS/DD Disks (10)	14.
6148	3 1/2" DS/DD Disks 3 Pak (30)	35.
3298	3 1/2" HD Disks 1.44 Meg (10)	25.

★MAXELL ... 60 day MBG

2792	3 1/2" DS/DD Disks (10)	15.
2793	3 1/2" HD Disks 1.44 Meg (10)	29.

★3M ... 60 day MBG

3943	DC2000 Tape Cartridge	21.
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ACCESSORIES

Apple Computer

1113	Black ImageWriter Ribbon	\$10.
1114	LaserWriter Plus Toner Cartridge	111.
1115	LaserWriter II Toner Cartridge	115.

★Avery ... 60 day MBG

4864	Disk Labels 3 1/2" (Qty. 250)	13.
5392	Disk Labels—Laser 3 1/2" (Qty. 630)	29.
5403	Address Labels 17/16" x 4" (Qty. 1000)	9.
4865	Address Labels 3 1/2" x 15/16" (Qty. 3750)	15.
4811	Transparencies 8 1/2" x 11" (Qty. 50)	22.
4813	Round Labels 3 1/2" (Qty. 150)	7.
4812	Laser Labels 1/2" x 1 3/4" (Qty. 2000)	7.
4807	Laser Labels 1" x 2 5/8" (Qty. 3000)	24.
4808	Laser Labels 1 1/2" x 4" (Qty. 1400)	24.
4809	Laser Labels 2" x 4" (Qty. 1000)	24.
4810	Laser Labels 8 1/2" x 11" (Qty. 100)	24.

★Basic Needs ... 60 day MBG

5635	Keyboard Flip	6.
5633	LaserWriter Printer Stand	28.
5634	Large Screen Monitor Stand	38.

★Computer Cover ... 60 day MBG

1722	ImageWriter LQ Cover	8.
1723	ImageWriter II Cover	8.
1720	Mac Plus Cover	10.
1724	Mac SE Cover	10.
1725	Mac SE Ext. Keyboard Cover Set	10.
4657	LaserWriter II Cover	10.

★Goldstein & Blair ... 30 day MBG

2267	The Macintosh Bible (2nd Edition)	19.
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★I/O Design ... 30 day MBG

2379	MacLuggage Imageware II	49.
2376	MacLuggage Macinware Plus	64.
2381	MacLuggage Macinware SE	75.
6129	The Ultimate SE Carrying Case	79.

★Kensington ... 30 day MBG

MacConnection carries the entire line of Kensington's accessories. Partial listing below.		
2577	Mouseway Pad	7.

2563	Mouse Pocket ADB	8.
2569	Mac Plus/SE w/System Saver Cover	9.
2558	ImageWriter II Dust Cover	9.
2589	Universal Printer Stand	15.
4970	Modem/FAX Protector 10	15.
6066	Custom Control Panel	15.
4971	Modem/FAX Protector 20	25.
4126	LaserWriter II Dust Cover	17.
2580	Mac II Stand	20.
2545	Universal Copy Stand	22.
2573	Tilt/Swivel (platinum)	22.
2578	Extra Long ADB Keyboard Cable	25.
2579	Mac II Monitor Cable Extension Kit	33.
4972	Power Tree 10	19.
4973	Power Tree 20	27.
4974	Power Tree 50	54.
2559	Apple Security Kit	34.
2568	Maccessories SuperBase	34.
2585	Printer Muffler 80	43.
2586	Printer Muffler 80 Stand	24.
4070	System Saver SE	52.
2566	System Saver Mac (platinum)	63.
2567	System Saver Mac (beige)	63.
2546	A-B Box (DIN-8)	63.
2556	Maccessories Anti-Glare Filter SE	33.
5064	Apple Color Monitor Polarizing Filter	63.
5065	Full Page Display Polarizing Filter	63.
5066	Two Page Display Polarizing Filter	135.
4941	Mac II Monitor Stand	64.
4643	Mac II Stand and Cable Kit	64.
6101	SE Bundle (incl. Copy Stand, System Saver, & Anti-Glare Filter) ... special	95.
2561	MasterPiece Mac II	105.
5894	PowerBacker 360	269.
5577	PowerBacker 450	339.
5578	PowerBacker 520	399.

5230	PowerBacker 800	\$749.
5228	PowerBacker 1200	949.

★MacConnection ... 60 day MBG

4623	Solid Oak Disk Case, made by New England craftsmen (holds 90 disks)	29.
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★Mobius Technologies ... 60 day MBG

4470	Fanny Mac QT	special 55.
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★Moustrak ... 60 day MBG

Available in blue or gray.		
2694	Moustrak Pad (standard 7" x 9")	8.
2692	Moustrak Pad (large 9" x 11")	9.
2693	Moustrak Pad L/F (9" x 11")	10.

★NoRad ... 30 day MBG

5620	Shield for Mac Plus or SE (*2524)	99.
5622	Shield for Mac II (*2523F)	99.

Ribbons

Available in black, blue, brown, yellow, green, orange, purple, red, silver & gold.		
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3255	ImageWriter II Ribbon	4.
3261	ImageWriter II 4-Color Ribbon	9.
3270	ImageWriter II Rainbow Six Pack	20.
3260	ImageWriter LQ Black Ribbon	17.
4011	ImageWriter LQ 4-Color Ribbon	20.

★Sopris Softworks ... 60 day MBG

4171	Mac SE Std. Keyboard Cover (navy)	15.
4019	Mac SE & Ext. Keyboard Cover (navy)	15.
4017	ImageWriter II Cover (navy)	11.
4018	LaserWriter II Series Cover (navy)	17.
4012	High Trek ImageWriter II Carry Case	49.
4013	High Trek Mac Plus Carry Case	59.
4014	High Trek Mac SE & Ext. Kybd. Case	69.
5877	Mac II Monitor Carry Case	59.
5839	Mac Icx CPU & Kybd. Carry Case	69.
4861	SE Protection Pak (std. keyboard)	65.
4862	SE Protection Pak (ext. keyboard)	75.

★Targus ... 60 day MBG

3618	ImageWriter II Carry Case	45.
3617	Mac Plus/SE Carry Case	55.
4015	Mac SE & Ext. Kybd. Carry Case	69.
6116	Mac IIcx Carry Case	85.

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- Upon receipt and approval, personal and company checks now clear the same day for immediate shipment of your order.
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- To order, call us anytime Monday through Friday 9:00 AM to 1:00 AM EST, or Saturday 9:00 AM to 5:30 PM EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 AM to 5:30 PM EST.

SHIPPING

Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all credit card orders phoned into MacConnection weekdays by 8 PM EST will ship Airborne Express the same night for delivery the next business day, except for those within UPS Ground Zone 1 (which is also an overnight service). Saturday delivery available to many areas upon request. The total freight charge on any order placed with MacConnection is now \$3. Backorders will also ship Airborne overnight at no additional charge. Some areas require an additional day delivery.

Hawaii, Alaska and Outside Continental US: Call 603/446-7711 for information.

Call MacConnection 1-800/334-4444 to order.

START UP

More than 30 hands-on reviews of hot new products await you in this month's StartUp. You'll find software that gives you full PostScript output of text and graphics on non-PostScript printers, an easy way to add digital sound to your stacks and applications, and an accounting package built entirely in Excel to lighten its debit entry on your accounts payables (to save you money, that is). Robert Wiggins' Pinstripe Picks scours the universe of business-productivity boosters — including everything from data analysis to mapmaking to the secret of Apple's success — and Bobker's Dozen contains reviews of 13 utilities that elevate the state of the Mac. Plus, there are Macintosh news, product updates, rumors, and — to start things off — our nominations for The Vaporware Hall of Fame.

CONTENTS

Computerized Classic Bookkeeping	74
Fontographer	75
Freedom of Press	77
MacRecorder 2.0	81
Smart Art II and III	83
Virtual	84
JetLink Express and MacPrint	86
Anatool	88
Language Master	92

EDITED BY RUSSELL ITO

Where Are They Now? The

BY JON ZILBER

True or false?:

"A watched pot never boils." If you ask the folks whose patience was tested waiting for the Mac Portable, Wingz, Finale, or the speed upgrade to 4D, they might concede that it *eventually* boils, but it sure steams up a lot of vapor along the way — and gets a lot of customers steamed up in the process. If you still believe that all things do, finally, come to those who wait, check out the rumorware residents of the *MacUser* Vaporware Hall of Fame. Here, in no particular order, are our nominees:



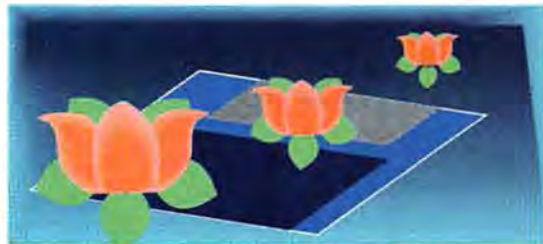
Knowledge Navigator:

Apple's videos of this ultimate portable computer raise eyebrows whenever they're screened at trade shows; they're intended to serve as teasers for what the future holds for the Mac. But no one inside Apple has actually said anything concrete about implementing the technologies of this high-concept notebook computer, which features voice input and output, universal (and cordless) telecommunications access, and an "anthropomorphic agent" that understands colloquial English (instead of computerese) and responds in a similar fashion. Maybe it will be released in time for everybody's favorite Vulcan to raise his famous eyebrow at the unveiling.

MITCH KAPOR'S 1-2-3

Lotus Mac:

If the answer is "1-2-3," the question must be "What are the three most popular guesses, in years, about how long it will be before the Mac version of Lotus' trademark spreadsheet ships?" Since its initial announcement in October '87, there's been no further word of a shipping date. But don't despair: Lotus acquired Mac-software-developer PS Publishing in January '89, so who knows? OK, Alex, next I'd like Great Expectations for \$300 . . .



On Technology:

Mitch Kapor (late of Lotus — remember?) started this company intending to develop system-software overlays for many computer platforms. Now the firm has scaled back its ambitions and will be starting off with a series of Mac utilities and applications. The first one is due "real soon now." (Really!)

Go Corporation:

Notice a pattern? Mitch Kapor is on the board of this startup company, which is rumored to be developing a notebook computer with handwriting-recognition capabilities so you can use a stylus to enter data and operating-system commands. This technology could influence Apple's future plans for laptop and notebook computers.

Vaporware Hall of Fame



Microsoft:

Database? What database?



Xanadu:

The undisputed king of vaporware (more than 15 years in the ruminating), futurist Ted Nelson's vision of a standardized global data structure, compatible with all computers and all forms of electronically accessible information, is still just that: a vision. When Autodesk acquired the rights to Xanadu in April '88, the company promised we'd be seeing the first products — probably for Sun workstations initially but designed for portability to other platforms, including Macs — within 18 months. The revised projected ship date is now "earlier than the fourth quarter" of 1990. The clock is ticking.



DOS-APPEARING ACTS

WordStar: Back in August '88, this company (formerly known as Micro-Pro) went so far as to take out splashy two-page ads announcing that the Mac version of WordStar (code-named Zeus) would be unveiled shortly. The ads were a little premature: Since then, some legal wrangling between WordStar and developer Challenger Software has more or less killed off this product — at least as far as WordStar is concerned.

XyWrite:

A Mac version of this power word processor for PCs is a perennial topic on the rumor circuit. No official word yet . . .

Ventura:

Persistent rumors to the contrary, the official word from Xerox is that there is no official word on when (or if) a Mac version of this popular PC page-layout program will appear.



Display PostScript:

Is Apple the odd man out in the PostScript sweepstakes? NeXT is using the same PostScript interpreter to drive both its screen and its printer, but Apple remains committed to using QuickDraw to create what you see on your Mac's screen. In the meantime, Apple has aligned itself with Microsoft in an attempt to establish a standard to compete against Adobe's de facto industry standard for output. Stay tuned.

NewsLine

Reports and Analysis

MAC II NOT TO BE

CUPERTINO, CA — Apple Computer has ceased manufacturing the 68020-based Macintosh II. With the introduction of the 68030-based Macs, the phasing out of the first expandable Mac has been expected for some time. The elimination of the Mac II will leave Apple with two distinct Mac CPUs: those based on the 68000 chip (the Plus, SE, and Portable) and those based on the 68030 (the SE/30, IIx, IIcx, and IIfx).

APPLE OPTS OUT

CUPERTINO, CA — In a blow to U.S. Memories, Apple Computer has decided against membership in the U.S. DRAM consortium. Although the consortium is in its earliest organizational stages, it had hoped to achieve support from as many DRAM consumers — especially computer manufacturers — as possible and had signed up IBM, Hewlett-Packard, and Digital Equipment. Although Apple would not officially comment, a spokeswoman for U.S. Memories confirmed Apple's lack of interest but characterized the manufacturer's response as "tentative." Apple's reason for deciding against membership was reportedly based on its currently steady and secure supply of DRAM from American, European, and Japanese sources.

SYMMETRY SYNERGY

SCOTTSDALE, AZ — Symmetry has merged with Teknon, the creator of various financial packages, including atOnce!, which is published by Layered. Symmetry, the publisher of Acta Advantage and HyperDA, will continue to support and develop its products. The new company will operate under the name Symmetry Software, and it's expected that its future products will steer toward the business market and away from smaller utilities.

KAWASAKI MOVES

CUPERTINO, CA — Guy Kawasaki, one of Apple's first evangelists and the founder of ACIUS, will leave the company as of December 1989. Maryène Delbourg-Delphis, chairman and president of ACIUS, will assume Kawasaki's former position.

Bobker's Dozen

Good Things and Small Packages

BY STEVEN BOBKER

Bobker's Dozen, c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404

Your suggestions, comments, and products for consideration are welcome.

1 Complete Undelete

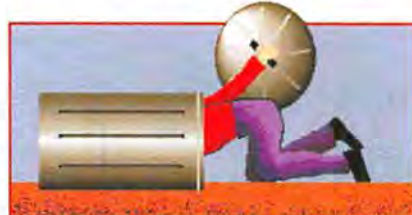
System 7 notwithstanding, there are still several small, handy utilities with a purpose and usefulness so obvious that you can't quite believe they didn't exist before. Complete Undelete is, by far, the best of this type of program. If a file can be brought back—that is, if it hasn't been overwritten—this utility will recover it.

And Complete Undelete doesn't stop where all other programs of its kind do: It can even recover fragments of partially overwritten files—often most of a file. Although you lose formatting, having the body of the text is what really counts.

This program can recover all deleted files, not only those

deliberately thrown into the trash. When you copy over a file and then decide you want the previous version back, just turn to Complete Undelete.

Complete Undelete is a slick, unobtrusive performer. The PreView mode shows which files are still there, how



much remains of partially destroyed files, and in some cases, what's actually in the file. This is great stuff.

\$49.95. 1st Aid Software, 42 Radnor Road, Boston, MA 02135; (617) 783-7118.

2 Hot Keys

Hot Keys from K.I.S.S. is a set of MacroMaker macros designed for use with MacWrite II, Microsoft Works 2.0, and PageMaker 3.0. The version I've reviewed is the MacWrite II version. (Apple's MacroMaker comes with all current System software, and a copy is included with Hot Keys.) MacroMaker is by no means the best of the various macro-type pro-

grams, but Hot Keys makes the best use of it that I've yet seen.

K.I.S.S. provides an overlay card for the function keys on any extended keyboard.

That in itself is enough documentation, but there's also a sheet listing the various key combinations as well as a short manual packed with tips on using this set of macros and using MacroMaker. A useful little program called MacroMover, which extends the utility of MacroMaker, is also included. A

new version for Micro-

soft Word 4.0 with

macros for Macro-

Maker and AutoMac

III was being readied

at press time.

At \$45 per applica-

tion, these macros

might seem expensive,

but considering the

time it would take you

to create and debug a

similar set, and in view

of the added produc-

tivity, they are really a

bargain. Now, if only

they came as a set of

QuickKeys.

\$44.95 per version.

K.I.S.S. (Keep It Simple

Software), 324 Fuller,

Suite C-3, Helena, MT

59601-9910; (406) 442-

3559.

\$195 plus licensing fees for com-

mercial use. SoftStream Interna-

tional, 19 White Chapel Drive, Mount

Laurel, NJ 08054; (609) 596-4373.

3 HyperHIT

HyperHIT is a set of HyperCard XFCNs and XCMDs (externals) that lets knowledgeable HyperTalk programmers build much better databases within HyperCard than was easily possible heretofore. Databases built with HyperHIT can be quite complex and can include several types of records, including both graphics (PICT) and sound (snd) records. The simple database I built also worked in SuperCard. Databases can be any size because the data is stored outside the database stack.

As with all HyperCard-based applications, databases created in HyperHIT are slow. However, these better HyperCard databases can be designed to export data to faster, more powerful applications after entry and processing within HyperCard.

4 Virex 2

The original version of Virex was the first commercial antivirus product. It quickly built a reputation for quality and quick responses to new viruses, that version was the lack of, an omission that was (The current version is was discovered within version 2.0. The usual had version 2.1 out nearly instantly.)



The main drawback of of a prevention mod-rectified in version 2.0. 2.1—the nFLU virus days of the release of prompt HJC reaction

Virex and its prevention module, VirexGuard, are excellent performers. They caught all the infected files in my test and were not too obtrusive. This product is a match for the other leading commercial virus fighter, SAM. Which one you choose is a matter of personal taste, as they present slightly different user interfaces. Both do the job well.

\$99.95; annual update service, \$75. HJC Software, P.O. Box 51816, Durham, NC 27717; (919) 490-1277.

5 Capture 2.0 ⚡⚡⚡⚡1/2

This latest version of the steadiest, most reliable screen-capture program for the Macintosh is in cdev form. Capture 2.0 works the same way as the original version, being activated by a key combination you choose. A cross-hair cursor lets you select the exact area for capture. The captured screen can be placed on the Clipboard or stored on-disk. Material is always captured in PICT format. Color screens (even 32-bit QuickDraw) screens are captured in PICT2 format.

Capture is a tiny program (9K), which makes it an excellent choice if you don't have

a hard-disk drive. Captured screens must fit into RAM at least temporarily, and color captures can easily take up 300K of RAM or more. If there isn't enough memory, Capture aborts, which does no damage.

Capture's performance is nearly perfect. AppleShare users may not be able to capture the leftmost quarter inch of the screen at all times, and Capture conflicts with some other cdevs and INITs. Changing its name to ~Capture should fix the problem.

\$59.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301; (818) 991-6540.

7 Family Matters ⚡⚡⚡⚡1/2



A diligently complete and current copy of Family Matters — a set of HyperCard stacks that allows you to record most aspects of your family's history, life, and possessions — can be invaluable in an emergency. Family Matters goes beyond Nolo's superb For the Record (see Quick Clicks, February '89), with room for

even more data (so filling in all the blanks will take considerable time and effort). The manual is only adequate, which contrasts with the superb and very useful For the Record manual.

8 XCAL ⚡⚡⚡⚡1/2

XCAL is a set of sophisticated HyperCard externals that creates spreadsheetlike capabilities within any HyperCard stack. Although the result isn't a true spreadsheet — and you are restricted by the small card size — quite a bit of calculation and formatting power is available. Formulas are linked to HyperCard objects, not cells, although they can be one and the same. XCAL has two modules; the first creates the objects and cells, and the second performs the calculations. The calculation module of XCAL can be

distributed in commercial stacks.

XCAL isn't for beginners. Someone new to HyperCard could do some simple cards; however, to get the most from XCAL, spreadsheet-building and HyperTalk experience are necessary. The large manual is reasonably complete but could be better written and printed. If you need the sort of spreadsheet and calculation capabilities that XCAL offers, it will save you a lot of time.

\$149.95. Trendware Corp., P.O. Box 2285, Huntington, CT 06484; (203) 926-9423.

6 Silverlining ⚡⚡⚡⚡1/2

If you need to partition your hard disk, Silverlining is one of the most powerful and useful hard-disk utilities you can find — most Apple engineers prefer it to Apple's own partitioning software. It can create partitions around existing files and resize them without loss. Silverlining can also format most drives, increasing performance in the process. There are also useful bad-sector-detection and mapping-out facilities as well as other powerful tests.

Silverlining's performance is excellent and caused no problems in my tests, although you must always back up in advance and be careful with software this powerful. The manual is clear.

The Silverlining package includes DS Backup, a program capable of full and incremental backups as well as full and selective restores. There's a nice little disk duplicator and a DA utility to handle the partitions you create. Silverlining isn't for beginners, but if you really want the most from your hard-disk drive, it's the way to go.

\$89.95. La Cie, Ltd., 16285 S.W. 85th, Suite 308, Tigard, OR 97224; (800) 999-0143 or (503) 884-0143.

The stacks are nicely organized and easy to navigate. However the data-entry screens are quite plain and often waste most of the screen. You cannot choose fonts, sizes, or styles. The printing function is basic bare-bones HyperCard printing. That's not nearly adequate for this sort of program; it desperately needs a good reporting module. Until that failing is rectified, you should use Family Matters in conjunction with TENpointO's Reports.

\$49.95. Springboard, 7808 Creekridge Circle, Minneapolis, MN 55435; (800) 445-4780 or (612) 944-3915.

9 DiskTop ⚡⚡⚡⚡1/2



Whenever I have to move things, rename things, find things — indeed, do any of the things that the Finder does or should do — I use DiskTop. Between the time this is written and the time you read it, a new, better, and more powerful version will have been released.

Based on the beta version I'm using, it looks as if nothing has been lost from the original and plenty has been added: Apple comments are supported, users can examine their AppleShare privileges, restarts as well as shutdowns are now possible, and volumes can be unmounted. The interface has been made more intuitive and easier to use. DiskTop is better than the Finder, and since it's a DA, it's always handy.

\$99.95. CE Software, 1854 Fuller Road, P.O. Box 65580, West Des Moines, IA 50265; (515) 224-1995.

10 POWERmenus



POWERmenus is two programs for the price of one. The first gives you access to all the current applications' menus, no matter where your cursor is located. This ability will be particularly welcomed by large-screen owners. A triple-click (or other user-settable command) pops up a menu of the menus, with submenus for each.

The second program, called Gadgets, is particularly well done and very useful. It includes a notepad; a good alarm clock; a telephone dialer; the current date and time; a window selector; and instant access to user-selected applications, DAs, and Controls (the individual panels in the Control Panel DA). The Controls are particularly useful because they circumvent the normal slow trip through the Control Panel DA.

Users can elect to use either part of the package or both parts together on the same pop-up menu. The Gadgets can also be made to appear as a menu in every application.

POWERmenus' performance is excellent. I found no conflicts nor anything that the program balked at. This is a well-designed and -implemented package, sure to be useful to nearly everyone.

\$79.95. Magic Software, 1602 Cascio Drive, Bellevue, NE 68005; (800) 342-6243 or (402) 291-0670.



11 Sonar Professional

1/2

This latest version of Sonar is faster and more expensive than previous ones, but no more recommendable. Most people who need the search capabilities Sonar Professional offers should get GOFer 2.0, whose list price is exactly 10 percent of this overpriced program. Both have roughly the same extensive range of search capabilities.

Sonar Professional now sports a standard Mac interface Card interface. Unfortunately, it uses the worst of each.

The program can search very fast; faster than anything else. But before you can search even a single page, all documents must be prepared in Setup, which is a slow process. The manual claims that Setup is MultiFinder-compatible, but that's only marginally true. Most of the time, Setup keeps the Mac so busy that nothing else can be done. I wouldn't use MultiFinder with this program.

To reach the fastest search speed, a second setup (Super Setup) is required! It's about 15 to 20 percent faster than Setup (that is, it's still slow). And if you want to search new or changed material, a full new Super Setup must be performed. Regular Setup, at least, is incremental.

Stay away from Sonar Professional unless you have hundreds of megabytes of archived (unchanging) data that needs to be searched. It might be somewhat useful with data CD-ROMs, but it's still far too expensive.

\$795. Virginia Systems Software Services, 5509 W. Bay Court, Midlothian, VA 23112; (804) 739-3200.



12 Front Desk MultiUser

1/2

This latest version of a very ancient Mac program — the first version was released in the fall of 1984 — still works well and has nearly its original interface. Front Desk MultiUser is a credit to its creators and keepers. This is an easy-to-use, high-quality schedule-and-appointment keeper, well suited for offices. It has no mechanism for tracking time, as does some of its competition, but it is a superior resource manager.

The new version supports color and the latest System software. Multiuser operation now allows one person to monitor and update schedules for everyone in a group (up to 25 users on AppleShare, up to 20 on TOPS; a copy is required for each station). Setup is simple because the options are few. The excellent basic design is easily adapted to small office situations.

\$99 (multiuser discounts available). Layered, Inc., 529 Main St., Boston, MA 02129; (800) 622-4436.



13 DeskPaint/DeskDraw

1/2

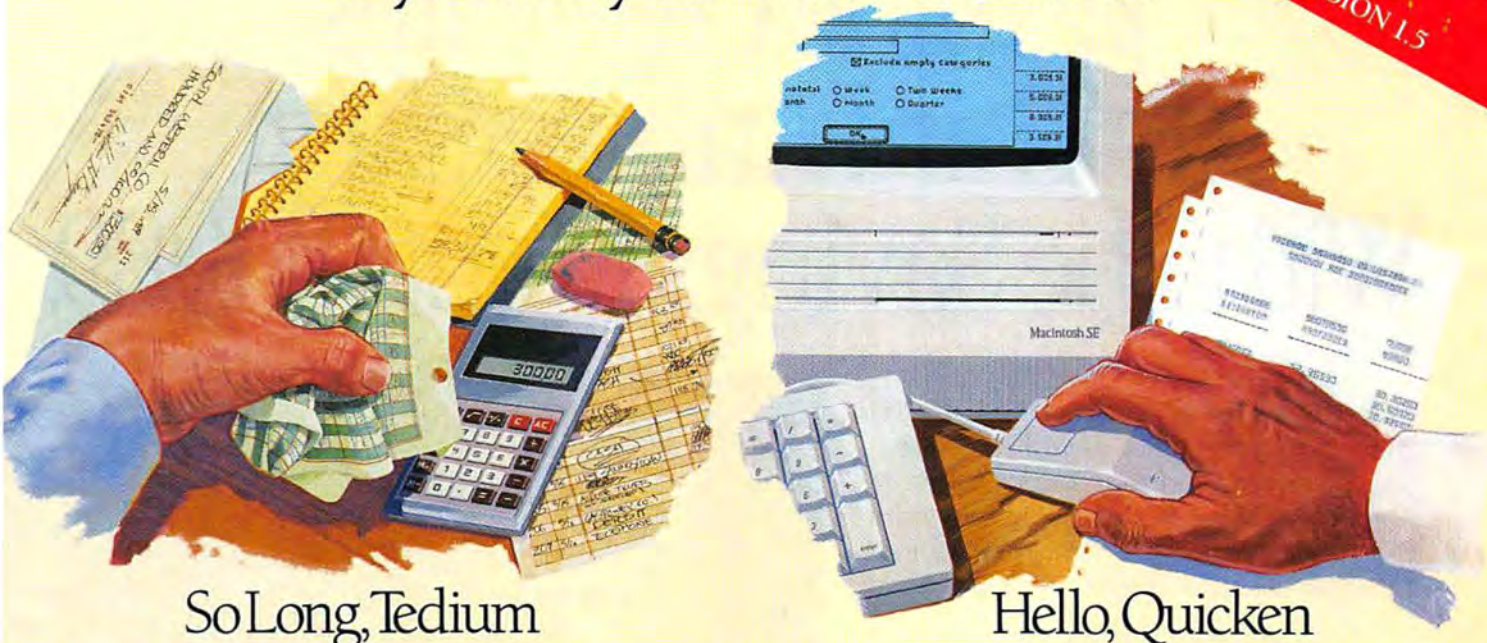
DeskPaint and DeskDraw put a reasonable amount of graphics power into two DAs. The interfaces are busy and sometimes less than intuitive (cleaner, improved versions are promised in early 1990), but don't be put off from these extraordinarily useful tools. For most users, the graphics touch-up and manipulation powers are more than adequate, and the ability to touch up graphics as you look at the relevant text (in a word-processing document, for example) is priceless.

There are a few things that you can't do with this DA duo: It doesn't offer color (yet), and you can work on only one document at a time (although multiple copies of DeskPaint are provided and can be open simultaneously). Still, DeskPaint runs on every Mac but a 128K, and it behaves like a champ. These two hard workers will always have a home on my Apple menu.

\$129.95. Zedcor, 4500 E. Speedway, #22, Tucson, AZ 85712; (800) 482-4567 or (602) 881-8101.

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NEW
VERSION 1.5



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The World's #1 Best Seller

Quicken is the best selling business and personal finance software in the world. Ken Landis of MacUser gives Quicken the highest rating of five mice and says, "Quicken is a great program...the industry standard." Broadway playwright ("Mame") Robert E. Lee remarks, "This astonishingly simple program...is truly true to its name. Indeed, it does quicken the time required for routine bookkeeping"



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G-MU01

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The Award Winning DirectDrive Series.

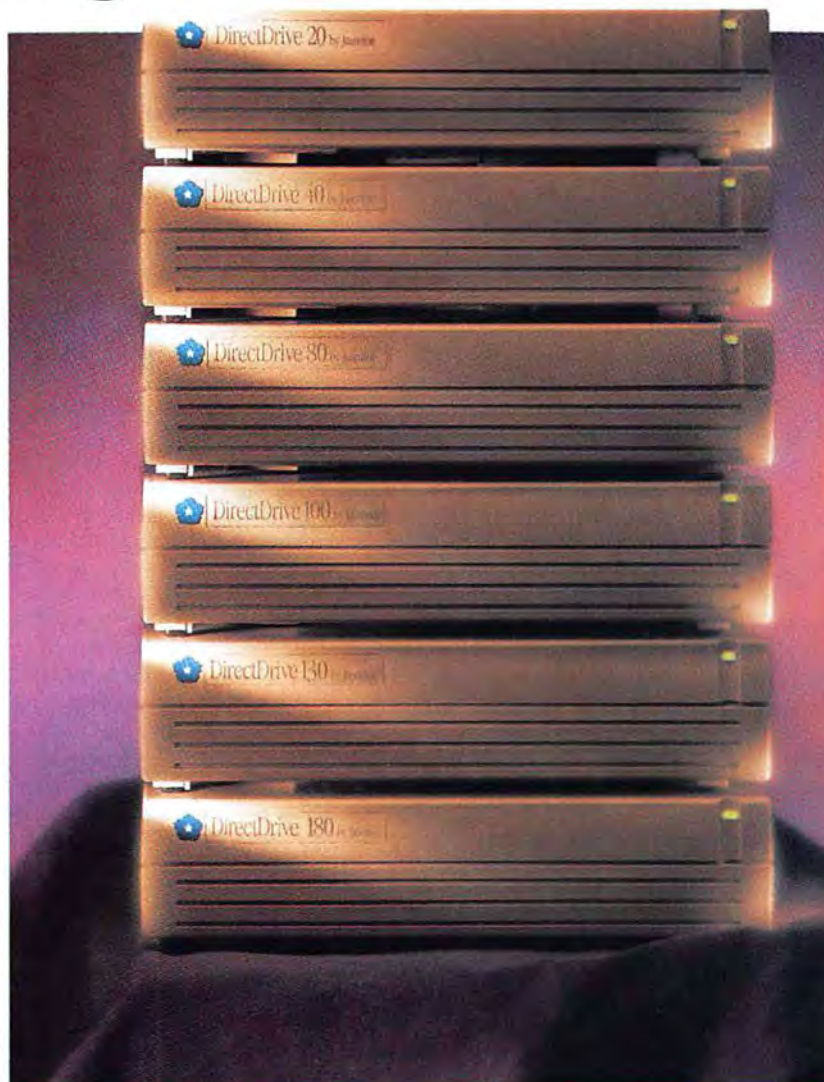
Jasmine continues to set the quality standard with the hard drives that swept the 1989 Macworld World Class Awards. Macworld readers selected Jasmine #1 in the "80MB or less" category, and in every single ranking (that's all 5) in the "above 80MB" category!

Jasmine DirectDrives are also the value standard. Every drive is bundled with DriveWare™, Jasmine's exclusive formatting and partitioning software which insures your data by performing drive diagnostics and error corrections on the fly; SUM II by Symantec™ which lets you recover data from a mistakenly-initialized hard disk; DemoWare™, a collection of demonstration versions of some of the most popular programs available; plus 5MB of public domain and shareware software.

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130MB	\$1349	\$1199
180MB	\$1599	\$1499

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DirectServe is a combination of hardware and software that's designed specifically to be a high-performance, low-cost file server. DirectServe can support up to 255 workstations with Mac IIcx speed, for less than the cost of a Mac Plus and AppleShare software!

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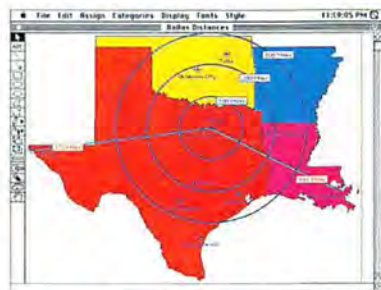
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Pinstripe Picks

BY ROBERT R. WIGGINS

MapMaker

MapMaker can create maps of continents, countries, states, and even counties, separately or in almost any combination, and with many options. Each area of a map can have up to 30 variables associated with it, which makes MapMaker a powerful tool for geographical data analysis. Once a map is drawn to your satisfaction, you can manipulate and customize it by using a tool palette that is similar to MacPaint's or MacDraw's and includes some special



MapMaker's straight-line and radius-measuring tools make it easy to add distances to any map.

map-making tools such as straight-line and radius-measuring tools.

MapMaker comes with more than 2 megabytes of

boundary and data files. For serious researchers, dozens of additional boundary- and demographic-data files are available at prices from \$50 to \$2,000, extending MapMaker's maps down to the Standard Metropolitan Statistical Area (SMSA) and even down to the

3- and 5-digit zip-code levels.
Version 4.0. Requires 512K. \$395.
Select Micro Systems, Inc., 322 Underhill Ave., Yorktown Heights, NY 10598; (914) 245-4670.

Best Answer

Best Answer is linear programming made easy. Linear programming is a widely used technique for finding an optimal solution to a problem whose variables and constraints can be specified mathematically. You can set up constraints,

adjustable variables, and what you're trying to optimize in an Excel, Multiplan, or Works spreadsheet; save it as a SYLK file; and let Best Answer do the hard work. Best Answer can handle up to 250 variables and comes with six examples that you can learn from and use as models for your own problems. Best Answer also performs sensitivity analysis (such as shadow pricing and

determining contribution ranges). The program provides some simple Excel functions, so you don't have to transfer back to Excel to make minor modifications to the worksheet for most "what if" analysis.

Requires 512K and Microsoft Excel, Multiplan, or Works. \$99. Heizer Software, P.O. Box 232019, Pleasant Hill, CA 94520; (415) 943-7667.

Crystal Ball

Crystal Ball is a forecasting and risk-management package that applies Monte Carlo simulation techniques to models you build with Excel, Multiplan, or Works. A wide range of probability distributions can be used, including normal, Poisson, binomial, exponential, and many more. If none of the built-in distributions suits your

fancy, you can create custom distributions. When running a simulation, you can stop it at any time and continue it later. The documentation includes a tutorial and explanations of all the statistical terms used.

One of Crystal Ball's only shortcomings is that it comes with just one example, so you may initially have a little trouble when building your own models.

Requires 512K and Microsoft Excel, Multiplan, or Works. \$395. Market Engineering Corp., 1675 Larimer St., Suite 600, Denver, CO 80202; (800) 288-2550 or (303) 893-0100.

THE CONNECTED EXECUTIVE

SoftPC

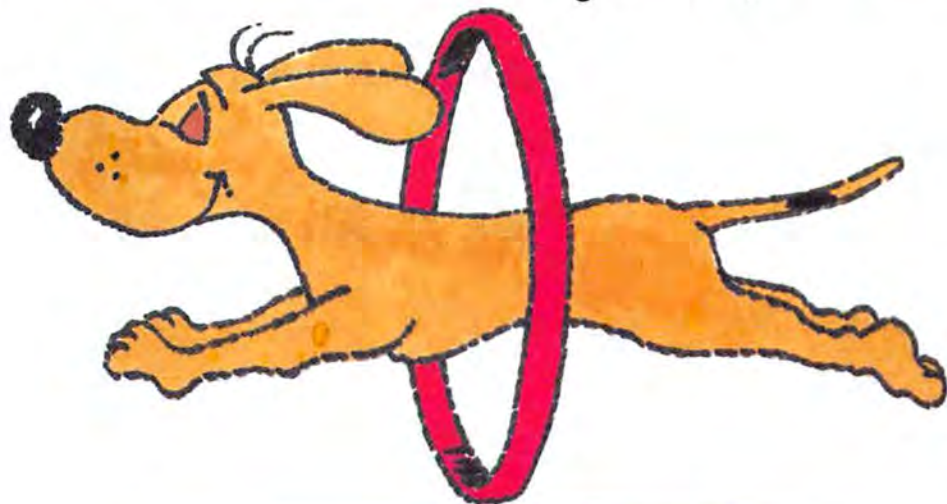


SoftPC is a software-based emulator that gives you the speed and power of a 640K IBM PC/XT with CGA video in a window on your Macintosh. It lets you run almost any program that runs on a PC or XT. SoftPC reads PC disks directly and can even boot from an Apple FDHD SuperDrive or Apple 5.25-inch PC Drive. Any Macintosh folder (including folders on AppleShare volumes) can be made accessible to SoftPC (only one at a time, though). SoftPC also supports the DaynaFile PC drive, but you can't boot from it.

SoftPC comes with MS-DOS version 3.3 and Microsoft's GW-BASIC interpreter and lets you use the Macintosh serial ports as COM ports. Version 1.3 of SoftPC features a lower price than earlier versions, requires less memory, and supports cut and paste between Macintosh and PC applications. If you've been looking for a way to get rid of those last PCs you keep around for special purposes (such as running PC-only vertical-market software), SoftPC may be just what you need.

Version 1.3. Requires 68020 or 68030 and at least 2 megabytes. \$399. Insignia Solutions, Inc., 254 San Geronimo Way, Sunnyvale, CA 94086; (408) 522-7600.

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DATA — Decision Analysis by TreeAge

 DATA is a Macintosh implementation of a decision tree, a form of decision analysis popular among Harvard MBAs. You create a chain of possible events arranged into a tree structure and assign probabilities to uncertain events and values to possible outcomes. You can then use DATA to analyze the tree to


BizPlan Builder

 BizPlan Builder is a set of templates for creating a business plan. The actual business plan is laid out in a series of MacWrite documents and also in one Word document, broken into sections. It includes spreadsheets for budgets, income statements, balance sheets, sources and uses, cash-flow projections, and break-even analyses. The documentation consists primarily of a printed copy of all the templates, with only a brief

introduction to get you oriented. While there's nothing really wrong with BizPlan Builder, you might find a similar product that has better documentation (such as Tim Berry's Business Plan Toolkit from Palo Alto Software) to be more useful. And no matter what templates you use, you'll still have to do 90 percent of the work to create a business plan; the templates are only guides.

Requires MacWrite 4.5- or Word 3-compatible word processor and SYLK-compatible spreadsheet program. \$99. JIAN/Tools for Sales, 127 Second St., Top Floor, Los Altos, CA 94022; (415) 941-9191.

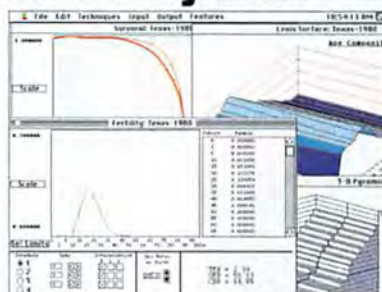
Interactive Population Statistical System

 IPSS is a statistical, simulation, and modeling program with some graphics capabilities that are designed to help demographics specialists project human populations. You enter information on age composition, fertility rates, survival rates, and/or migration, and you can even add a special rate to study its effect on the population (cancer rates are used in the example files). Once the data is entered, you can run projections and get results in tabular or graphic form. Some of the graphing methods available here are

lexis surfaces, 100-percent surfaces, and 3-D population pyramids.

The one weakness in IPSS is data entry; IPSS includes no facility other than copy and paste for importing data to other programs. This is doubly odd because IPSS provides several ways to export data.

Overall, IPSS is a good system with a strong quantitative background (the Pascal code for the projections and life-table analysis is even included



in the documentation).

Requires Macintosh Plus or later. Plus or SE version, \$295; 68020/68030 version, \$395. PSRC Software, Population and Society Research Center, Bowling Green State University, Bowling Green, OH 43403; (419) 372-8648.




find the branches that will yield the highest profits or lowest expenses. If you've tried to perform this kind of analysis with a spreadsheet, you've probably found it difficult, if not impossible.

DATA is a fairly good implementation of the decision tree model but would benefit from additional examples and expanded documentation. If you're familiar with decision analysis, you'll appreciate this program. If you don't already know decision analysis, you might want to study the technique to make sure you can work with it before investing in software you might not find that useful.

Requires 512K. \$495. TreeAge Software, Inc., 23rd Floor, One Post Office Square, Boston, MA 02109; (617) 426-5819.

BUSINESS BOOKSHELF

The Macintosh Way

 Guy Kawasaki is a legend in the Macintosh community. One of Apple's first "evangelists" for the Macintosh, he convinced a lot of people that writing software for a 128K computer with no hard disk was a smart idea. After the Mac became a success, he left Apple to start up a small company (ACIUS) to market another legend, the database program code-named Silver Surfer, which became 4th Dimension. *The Macintosh Way* is Guy's story, mixed with his views on the Macintosh market, flavored by anecdotes and exercises, and leavened with a lot of humor.

Kawasaki doesn't tell a story so much as he tries to communicate an experience — the Macintosh experience — from an insider's and an outsider's point of view. Whether you're looking for some marketing pointers or some belly laughs, there's something in this book for you. Every Macintosh aficionado should read this book. Some of the jokes are a bit inside, and Kawasaki warns that the book is aimed at the "inner circle," but even if you think you're outside the circle, you can still enjoy the book.

EXERCISE: Read all of *The Macintosh Way*. Did you find a successful software company?

\$19.95. Scott, Foresman and Co., 1900 E. Lake Ave., Glenview, IL 60025; (312) 729-3000.

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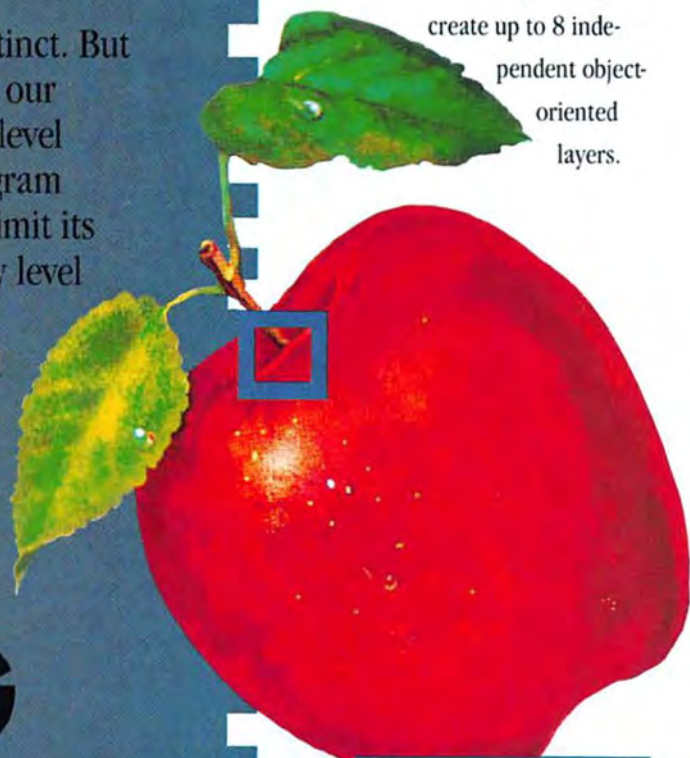
Simply stated, UltraPaint

does everything you want it to today. And tomorrow.

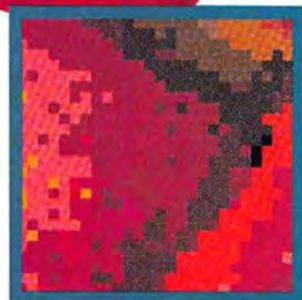
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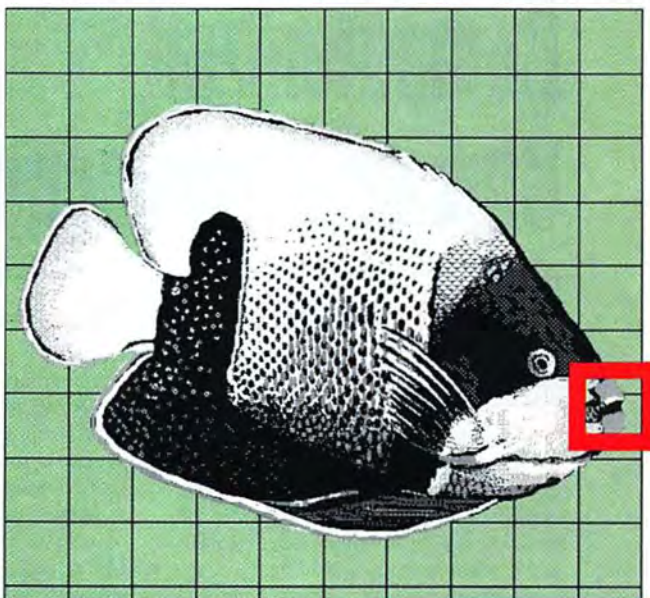
And thanks to its breakthrough Open Architecture design, UltraPaint lets you add new tools, filters and effects by simply dragging them into a special folder - which means you'll never be stuck waiting for upgrades again!

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BUSINESS ACCOUNTING

Computerized Classic Bookkeeping

A spreadsheet-based accounting system 'Excels' as an alternative to bigger, dedicated packages.

One of the thorniest problems that has faced the accounting-software industry has been how to build a general-ledger system that is both structured enough to get the job done and flexible enough to support financial analysis. The most likely platform for this kind of product is a spreadsheet. But in the past, accounting-spreadsheet templates have been either too loosely defined or too rigid—the same problems users have faced with dedicated systems.

Computerized Classic Bookkeeping (CCB), from Absolute Solutions, is the first spreadsheet-based accounting template to really make a mark in the industry. CCB is built on Microsoft's Excel and passes on all of Excel's benefits and only a few of its disadvantages.

WHAT IT IS For first-time spreadsheet users, the system offers an intuitive feel to its accounting method. Mimicking the

paper journals and ledgers that bookkeepers and accountants are accustomed to, CCB applies Excel's calculational power to the relatively simple task of maintaining a general-ledger system.

Absolute Solutions has built a full menu-driven command system to control CCB's accounting functions. Users can stay within this system or can go directly into Excel at any time to do advanced analysis. Custom worksheets and analysis can be integrated easily into the CCB posting system, so virtually any type of account or business can be managed with CCB.

CCB should be considered an accounting tool kit rather than just a general-ledger system. This tool kit can be used to handle simple tasks or to create complex systems. For example, CCB provides a standard function that tests and prevents the posting of unbalanced journals. This utility is used throughout the CCB system because it automatically attaches itself to any custom worksheets you define.

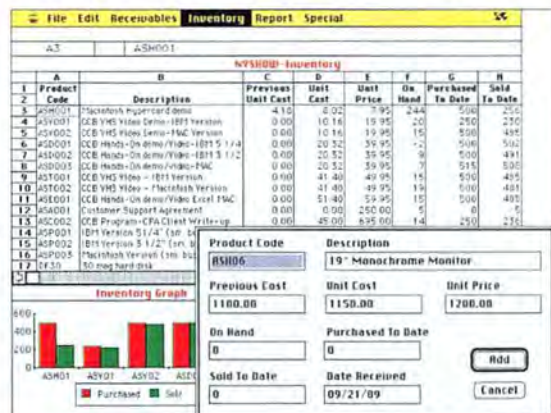
CCB also provides a full, detailed audit-trail capability and password-protection options for all reports, journals, and ledgers. Another fail-safe system built into CCB prevents you from

making common accounting errors, such as defining an accounts-receivable entry as accounts payable.

Because CCB runs under Excel, it provides complete reporting flexibility. Built into the CCB system is a financial-reporting module that produces any standard accounting report as well as a valuable cash-flow analysis for small-business owners.

CCB comes with a complete chart of accounts that can be easily edited to accommodate any business. The chart uses standard accounting numbering systems and account captions.

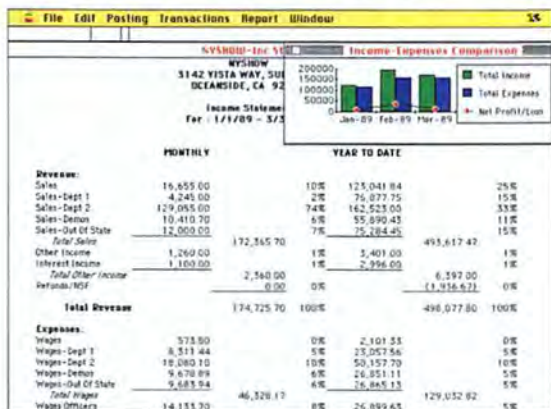
HOW IT WORKS The system can keep as many accounting periods as a user wants open and on-line. Line-item details can be quickly recalled and analyzed at any time



CCB's inventory data can be entered directly into the inventory spreadsheet or through the unique dialog box shown here. The information can be sorted and graphed. CCB also lets users create special functions for exploding invoices, time and billing integration, and price adjustments for business-overhead expenses.

from any previous period. CCB can also generate the full complement of business graphs available from Excel. This graphics capability is very important for small-business owners and accountants who use the CCB system for write-up work—complex information can be summarized and displayed quickly and easily.

CCB can be run either as a consolidated ledger system or with subledgers. There's no program limit to the amount of information the system can track or to the amount of detail stored. In fact, one major advantage of using a spreadsheet-based accounting system is that it can be used not only for accounting but also for record keeping. Considering the inherent



Computerized Classic Bookkeeping (CCB) is an accounting system built entirely on Excel. The Income and Expenses Comparison graph is predefined and generated by a CCB command. Custom graphs can also be created, and CCB's Report menu lets users customize the format and display of their financial statements.

GRAPHICS

Fontographer 3.0

The top font generator gets a classy face-lift.

flexibility of Excel and the leverage that CCB provides, any small-business owner can consolidate all of the business's financial information into the CCB system with very little trouble.

Unfortunately, because of an Excel limitation, CCB does not provide context-sensitive help screens, which would be a major asset. [Excel 2.2 supports context-sensitive help, so CCB version 2.2, which should be available by the time you read this, will include on-line help. CCB version 2.2 will also take advantage of Excel 2.2's extensibility and will include job costing, via an external to FoxBASE. The package will include a run-time version of FoxBASE. —Ed.]

Absolute Solutions provides superior telephone support and has produced an adequate manual for the product.

CCB runs only in single-user mode (another Excel limitation), but it can share files across any network — provided no two users try to access the same file at the same time. In summary, the CCB/Excel combination provides a remarkable level of accounting, record keeping, and analysis in a simple, flexible product that can also be easily customized if necessary. CCB should be considered by any small-business owners or accountants who use manual write-up systems for their general ledger.

— Ken Landis

Get Info

Computerized Classic Bookkeeping

★★★★½

List Price: Small- to medium-sized-business package, \$395; version including job costing and departmentalization, \$1,295; accountant-client write-up package, \$695; personal-accounting version, \$99.

Published by: Absolute Solutions, 3142 Vista Way, Suite 400, Oceanside, CA 92056; (800) 633-7666.

Version: 1.5.

Requires: Hard disk and Excel 1.5 or later.

Application Size: 200K.

Compatibility: Mac Plus or later.

Fontographer has long been the only game in town if you wanted to create your own downloadable PostScript fonts. When introduced in 1986, it was an impressive achievement — even with the nasty drawback of copy protection.

Altsys has now released a major new version of Fontographer, version 3.0. The

the basic look and feel of the earlier versions, with the straightforward ability to edit or create designs in any of the 256 character slots of any PostScript font you choose. Using Bezier control points, you design the characters and then have the program create both the downloadable PostScript font and the screen fonts. You install the fonts in the normal way.

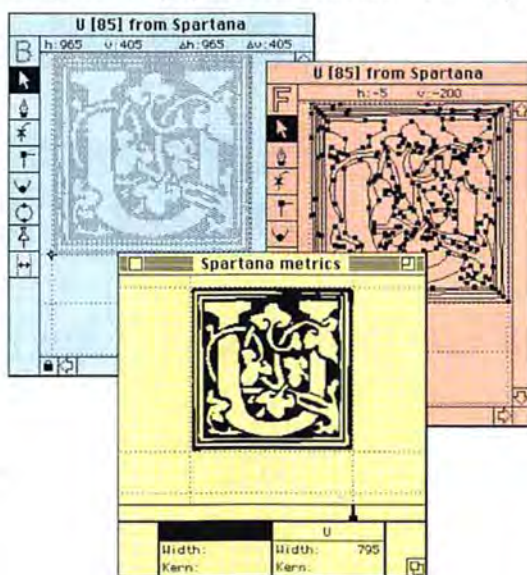
Foremost among the new features are an integrated screen-font editor, auto-tracing, and a pen tool (the latter is similar to those in FreeHand and Illustrator 88).

The integrated screen-font editor is a great convenience in serious font production. In the old days, Fontographer generated rough-and-ready bit-mapped screen fonts, but you couldn't edit them (and they often needed editing) without switching to another program. Unfortunately, Altsys provides only a bare-bones bit-map editor in the new Fontographer. You get a pencil tool and a grabber, and that's it — barely enough to get by.

With the new auto-tracing feature, you can paste background images into a

character cell and then have Fontographer trace it for you — providing points, curves, and fills as needed. This is a colossal time-saver if you want to convert a number of scanned images into PostScript.

The welcome pen tool conveniently combines the capabilities of tangent, corner, and curve tools into one. It relieves you of continually having to switch tools — something earlier versions made you do a lot. It seems odd, though, that Altsys, the developer of FreeHand, decided not to include a freehand drawing



Fontographer 3.0 is a major upgrade of the preeminent font generator. Its auto-trace feature shines when you're working with complicated images. The top window shows a bit map of a fancy uppercase U pasted into the background layer. The center window shows the result of auto-tracing that image. The bottom window, the Metrics window, lets you preview characters as well as create kerning pairs.

package and manual have been completely redone, a few major features have been added, and scores of minor improvements have been made. There's hardly a dialog box that hasn't been touched up at least a little.

WHAT IT IS Originally, Altsys positioned Fontographer purely as a font generator. Now, in trying to reach a wider audience, Altsys is placing more emphasis on the logos and graphics you can create in specialty fonts with the program — although their tools are pretty meager.

In any case, Fontographer 3.0 keeps

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tool in the Fontographer program.

HOW IT WORKS Version 3.0 adds many features that increase productivity, such as more keyboard shortcuts, optional snap-to guidelines, better printing options, and no more copy protection.

Fontographer has always been a professional tool, capable of sophisticated jobs such as creating kerning tables and building composite fonts based on fonts already in your printer. In keeping with this heritage, version 3.0 adds the feature of including PostScript "hints" in your fonts, which can improve the look of your fonts when you print them on 300-dpi printers in small point sizes.

Overall, the new version is worth the upgrade, even though there's still room for improvement (especially in beefing

up the bit-map editor). Although the manual is improved in this version, it still suffers from a poor index, typos, and several confusing illustrations. Finally, if Altsys seriously wants buyers to use Fontographer for graphics, it needs to

include better drawing tools, including a freehand drawing tool and shape tools such as boxes. Considering Altsys' history as FreeHand's developer, these are glaring omissions.

— Dave Valiulis

UTILITIES

Freedom of Press

Now you can get PostScript-quality output on non-PostScript printers at a fraction of the cost of using true PostScript systems.



The DTP revolution was made possible, in part, by PostScript. But PostScript printers are expensive. What is there for people with limited budgets or who already have a non-PostScript printer (such as an HP LaserJet II)?

Freedom of Press, from Custom Applications, has just brought them into the charmed inner circle for a fraction of the cost that previously secured membership. Freedom of Press takes PostScript code generated by Mac programs and interprets it so that a wide range of non-PostScript printers can render pages correctly. It sounds good, but does it really work? It does indeed — and well.

WHAT IT IS Freedom of Press requires a Mac II or SE/30 with at least 1.5 megabytes of RAM and a hard disk. Once you've installed the program (and assuming you're already hooked up to one of the more than 30 printers and film recorders supported), you're all set to go.

You first prepare files for use within Freedom of Press by saving PostScript versions of the files to disk. In most cases (PageMaker is an exception), you do so by opening the document

within the parent program, selecting Print, clicking on OK, and immediately pressing Command-K. You enter Freedom of

Socratic Perspectives and Hellenic Thought

ἀλλὰ γὰρ ἡδὴ ὥρα ἀπιέναι, ἐμοὶ μὲν ἀποθανουμένῳ, ὑμῖν δὲ βιωσομένοις· ὁποῖοι δὲ ἡμῶν ἔρχονται ἐπὶ ἀμείνων πράγμα, ἀδῆλον πάντι πλην ἢ τῷ θεῷ.

Now is the hour, now at long last, for leaving — for me to die, for you to go on living. But which of us sets out for the better fate, that's unclear to everyone but God alone.

— Socrates

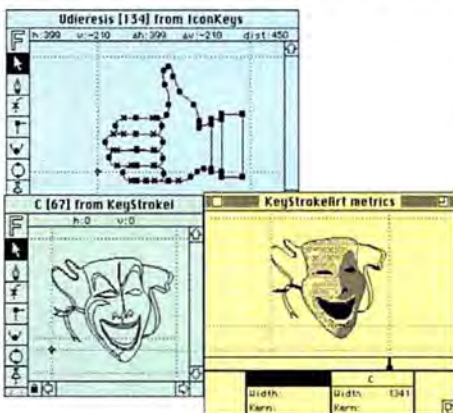
Socratic Perspectives and Hellenic Thought

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— Socrates

An HP LaserJet running Freedom of Press (top) and an Apple LaserWriter Plus (bottom) produce nearly identical samples of Bookman, Helvetica Bold, and Palatino. But in the downloadable Greek font, called Kadmos, Freedom of Press incorrectly placed the accents.



Altsys likes to remind users that they can do more than just create alphanumeric fonts with Fontographer. If you think of each character cell as a scaled-down FreeHand (or Illustrator 88) drawing window, you'll appreciate how useful Fontographer can be for creating specialty artwork fonts. You won't find the full-featured drawing tools of FreeHand in Fontographer, though.

Get Info

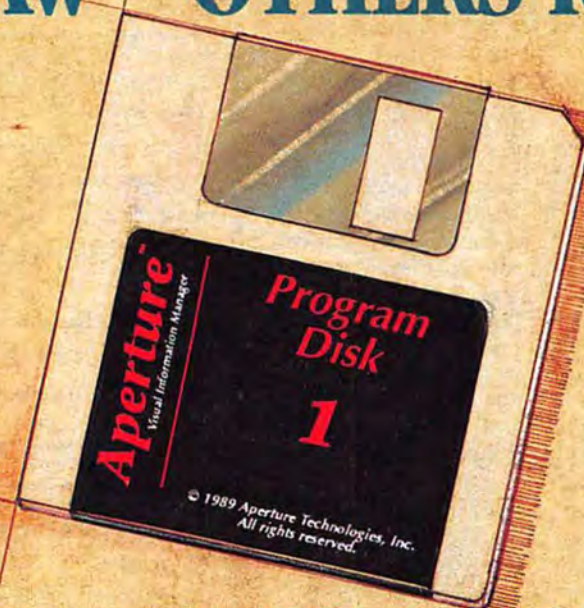
Fontographer

List Price: \$495; upgrade, \$70.
Published by: Altsys, 720 Avenue F, Suite 109, Plano, TX 75074; (214) 424-4888.
Version: 3.0.
Requires: System 4.2 and Finder 6.0 or later.
Application Size: 394K.
Compatibility: Mac Plus or later.



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Press next, select the PostScript file(s) you've generated in this manner (and yes, you can queue several to print in batch mode), and choose Print. Depending on the printer your Mac is attached to, the output can be virtually identical to what you'd obtain from a bona fide PostScript printer.

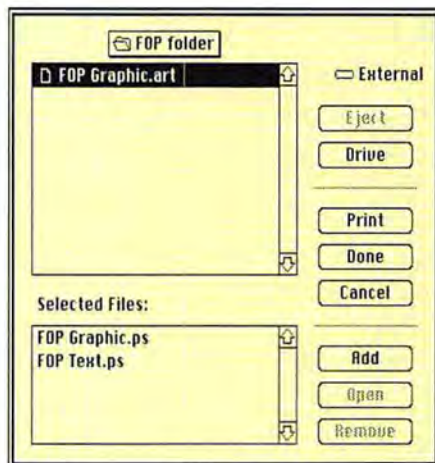
HOW IT WORKS Unfortunately, there are some disadvantages. First, in terms of Adobe fonts, you are restricted to the 35 fonts of the LaserWriter Plus. Freedom of Press supplies character outlines only for this collection of Adobe fonts (other Adobe fonts are encrypted, and you cannot use them). You can use downloadable PostScript fonts from other

vendors, but problems can arise with these.

Second, the PostScript versions you create for use with Freedom of Press are always larger than the original documents — often more than double their size — which can clog up a hard disk in a hurry.

Third, I found using Freedom of Press to be even slower than printing with a standard LaserWriter Plus. Most files I tested took twice as long to process.

On the positive side, the savings can be astounding. For example, for *less than* \$3,000, you can buy an HP LaserJet II with 2 megabytes of RAM and Freedom of Press. That combination gives you the rough equivalent of a LaserWriter Plus at half the cost.



Freedom of Press lets you print PostScript files on non-PostScript printers. Its main window lets you select, queue, and print any PostScript files you have on-disk. The program can be set to delete files after they've been printed or to auto-select files placed in a certain folder.

Most importantly, Freedom of Press performs remarkably well. Its ability to deal with PostScript makes it superior to programs such as MacPrint and JetLink Express (reviewed elsewhere in this issue). So if you can live with Freedom of Press' font, storage, and speed limitations, you can get PostScript quality without the exorbitant cost.

— Gregory Wasson

Get Info

Freedom of Press



List Price: \$495.

Published by: Custom Applications, Building 8, 900 Technology Park Drive, Billerica, MA 01821; (800) 873-4367 or (508) 667-8585.

Version: 2.1.

Requires: 1.5 megabytes of RAM, 800K floppy drive, 2.5 megabytes of hard-disk space, and any application that generates PostScript output.

Application Size: 382K.

Compatibility: SE/30, Mac II family, or any Mac with a math coprocessor.



These two panels compare the output of the same Illustrator 88 file from an HP LaserJet-Freedom of Press combination (top) and from an Apple LaserWriter Plus (bottom). The results are virtually identical, with some slight shifts in the way the gray scales were rendered in the leaves.

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ARE YOU STILL EVADING YOUR TAXES?

HARDWARE

MacRecorder 2.0

Digitize and manipulate your favorite sounds, and enliven your Mac, stacks, and presentations.

Farallon Computing's MacRecorder is really four elements — one hardware and three software — that let you sample (or digitize) any sound; modify and enhance it in various ways; and integrate it into a HyperCard stack, animated presentation, another application, or your System Folder. As such, it's useful for serious Mac programmers; people who build HyperCard stacks; businesspeople who create presentations or

training material; and your basic computer/audio/visual nerds, eager to clog their system and annoy their coworkers with their own puerile samples.

WHAT IT IS The hardware is a palm-sized analog-to-digital converter that accepts a sound and converts it into digital data that it sends to the Mac. It can pick up a sound with its built-in condenser mike or, via two 1/8-inch jacks, from an external mike or line-level signal that comes out of a CD player, tape deck, or VCR.

SoundEdit, the first of MacRecorder's software elements, controls the actual sampling of a sound and then lets you edit the sample with some impressively sophisticated, yet easy-to-use, tools. You can add such effects as echo, flanging, and noise; modify a sound's volume or brightness; bend the pitch of any part of a sound; or make a sound play backward. With standard Cut, Copy, and Paste commands, you can move chunks of a sample around to create, for example, embarrassing party versions of the messages your friends and associates leave on your answering machine.

HOW IT WORKS New to version 2.0 are the Sonogram and Spectrogram commands, which do two kinds of frequency analyses on your sounds to show you precisely what you've sampled and to guide your editing decisions. SoundEdit can generate sine, square, and sawtooth waves and do rudimentary frequency-modulation synthesis to create both musical and sound-effects tones. The program can even change the playback speed of a sample without changing its pitch, a feature I'd expect to find only in more specialized (and expensive) sample-editing applications.

To optimize storing your samples — they tend to get large — SoundEdit lets you choose from four rates at which to sample and four ratios at which to compress sound files. All this may sound numbingly technical, but it's not. Anyone with a serious — or even frivolous — interest in audio can get up to speed quickly.

The other — and more mainstream — side of MacRecorder's software consists of the HyperSound Toolkit, a set of HyperTalk external commands and functions for using sounds in HyperCard stacks, and an example stack called HyperSound. Together, and with the help of the friendly, well-written manual, they let even HyperCard tyros build stacks that moo, meow, and moan.

Mac application programmers can use

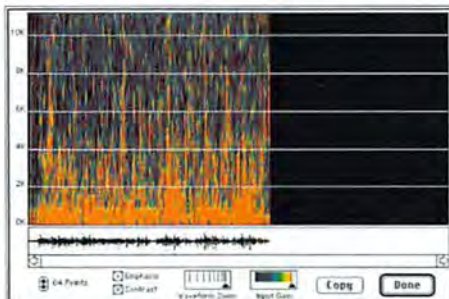


MacRecorder is an audio digitizer with software that lets you add sounds to your stacks, presentations, and even your Mac itself.

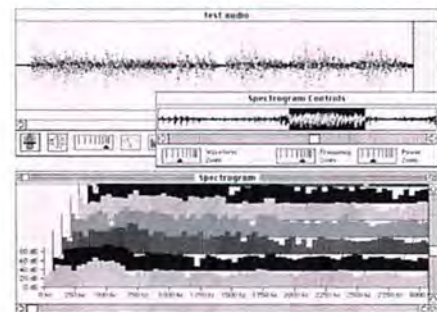
MacRecorder sounds in any program. Also, presentation programs such as VideoWorks II and MacroMind Director, and entertainment staples Jam Session and Studio Session, can all access MacRecorder sounds.

Especially at the price, MacRecorder offers a lot of functionality and a lot of fun. It's a terrific add-on for any users who need to add some life to their stacks or just want to make working with a Mac more amusing.

— Tim Tully



SoundEdit is the MacRecorder application that lets you control and manipulate your samples. The Sonogram command produces this graph, which charts the relative strengths of frequencies in a sample. The information is useful for distinguishing between different but similar sounds.



SoundEdit can produce a spectrogram, which charts the strengths of frequencies in a sample. Because it offers more detail, the Spectrogram command is generally more useful for studying short samples than is the Sonogram. The Spectrogram Controls window lets you adjust the chart to your particular needs. The Test Audio window shows the source being studied.

Get Info

MacRecorder ★★★★★1/2

List Price: \$249.

Published by: Farallon Computing, 2201 Dwight Way, Berkeley, CA 94704; (415) 849-2331.

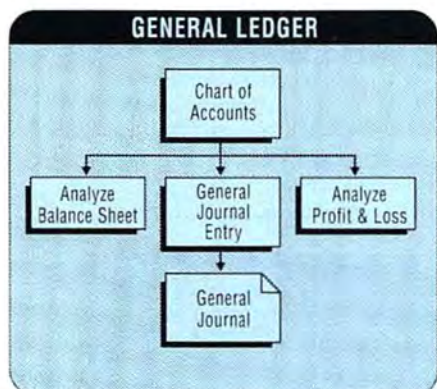
Version: 2.0 (SoundEdit).

Requires: 512K RAM (1 megabyte recommended); HyperSound requires HyperCard version 1.2.1, or later.

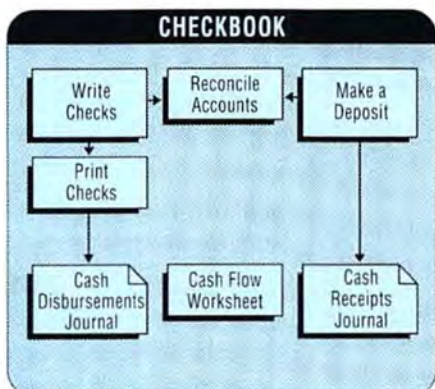
Application Size: SoundEdit, 263K; HyperSound, 200K; HyperSound Toolkit, 234K.

Compatibility: Mac Plus or later.

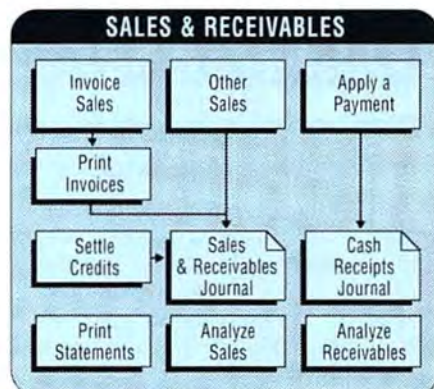
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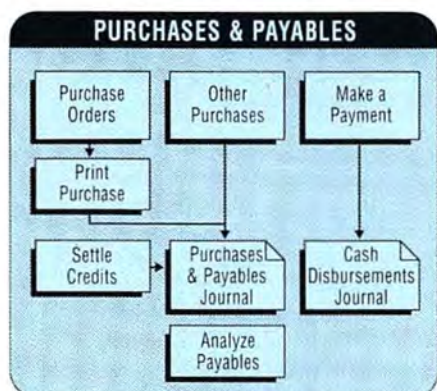
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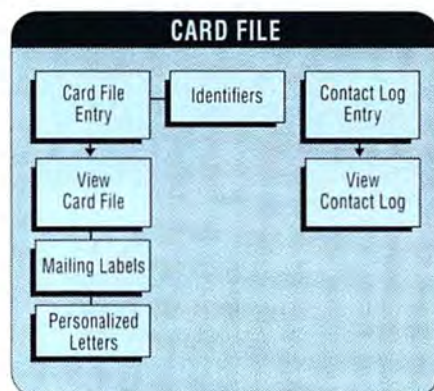
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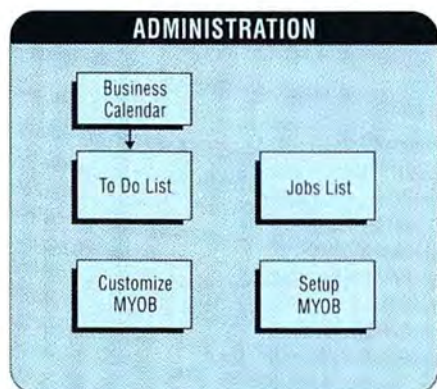
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GRAPHICS

Smart Art II and III

Two new volumes in the Smart Art series offer major improvements that let you put PostScript effects where they've never been before.

 Smart Art is in the vanguard of the new generation of PostScript special-effects utilities that leave earlier programs such as Laser FX and LPTeX in the dust, primarily because Smart Art lets you place EPSF graphics where they've never been placed before (for example, in

collection dedicated to graphic elements such as cubes and starbursts. Smart Art III contains new text effects, including kerning controls for many of the effects, which were lacking in the first collection.

HOW IT WORKS What really shines is the upgraded DA. It's a commendable

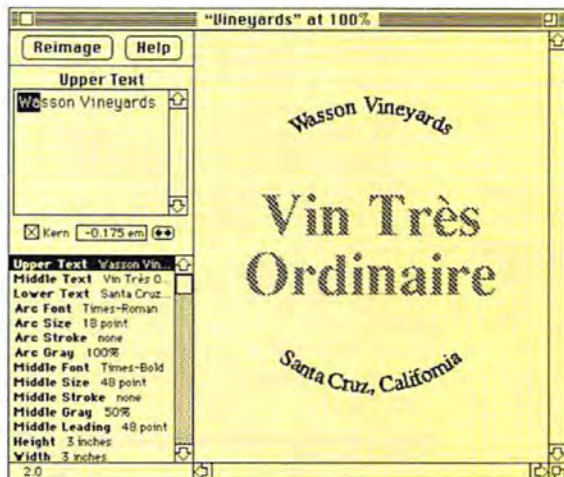
piece of work worth every cent of the \$149.95 list price, even without the effects files. It now supports printing from within itself — a feature oddly absent in the initial release. There is also a new Export command on the menu that lets you export Smart Art files as PICT or TIFF (in 72-, 300-, and 600-dpi resolution). TIFF, especially at 600 dpi, is excellent for use with tracing programs such as Streamline or with applications that can auto-trace imported TIFF files.

Smart Art is also a must-have tool for anyone who dabbles in PostScript, because you can create PICT screen

images of your own PostScript programs or of the files created by earlier non-WYSIWYG programs such as Laser FX.

Smart Art II and III are significant improvements over the original Smart Art — which was itself a solid PostScript utility. With the addition of printing and graphic-exporting capabilities to its DA, Smart Art has now realized its potential and has become an essential tool for desktop publishers and PostScript experimenters who've always wanted a simple way to view their PostScript creations. If you've always wanted to liven up your documents with snazzy PostScript effects, you really owe it to yourself to add these excellent utilities to your software collection.

— Gregory Wasson



The main window in the Smart Art 2.0 DA sports numerous controls that let you customize almost any aspect of the canned effects that come with the DA.

Word or MacWrite files).

With the release of Smart Art I, the distributor, Emerald City Software, promised that some new collections of effects would be forthcoming. Well, it was true to its word. And not only has it introduced two new collections of effects, but it has also begun to distribute a spiffed-up, revved-up version of the DA that makes it all possible.

WHAT IT IS The DA allows you to select any EPSF file on-disk and preview it in the Open dialog box. If the file is a prefabricated Smart Art effect, the DA's main Control Panel gives you several controls that let you modify the effect. You can then reimage the file if you are connected to an on-line PostScript printer and see the results on-screen. Smart Art II is a

Wasson Vineyards

Vin Très Ordinaire

Santa Cruz, California

Smart Art II and III, two new collections of PostScript special effects, cover both text and graphics shapes for use in DTP or word-processing programs. These EPSF graphics were placed in a Word 4.0 document, even though Word ordinarily doesn't accept EPSF.

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Get Info

Smart Art II and III



List Price: \$149.95 per collection.

Published by: Emerald City Software, 800 Menlo Ave., Suite 102, Menlo Park, CA 94025; (415) 324-8080.

Version: 2.0.

Requires: PostScript printer.

Application Size: 184K each.

Compatibility: Mac Plus or later.

UTILITIES

Virtual

If you're looking for virtual memory, you don't have to wait for System 7.

After the announcement of System 7, the term *virtual memory* became one of the most often used buzzwords in the Mac community. You don't have to wait for System 7 to get virtual memory, though — Connectix's Virtual gives it to you now.

Virtual is an INIT that requires a Mac II with an installed PMMU (Paged Memory Management Unit) chip or any 68030-based Mac (the 68030 has a PMMU built in). Pluses or SEs based on the 68000 (unaccelerated) cannot have virtual memory. Virtual makes your Mac think it has 8 megabytes of RAM even if it has only 2 or 4 megabytes.

Essentially, Virtual uses the hard disk to get your Mac to reuse "real" RAM several times, making it appear as though you have more than you really do. For a more detailed discussion of how virtual memory works, see the "Virtual Memory" sidebar.

Virtual version 1.05 makes 8 megabytes accessible to your Mac; it requires 8 megabytes of contiguous free space on your hard disk to swap with and at least 2 megabytes of real RAM.

With the current System, Virtual is most useful for opening multiple applications under MultiFinder. If you have an application that needs 8 megabytes and you have only 2 megabytes of RAM, your hard disk will be very busy swapping memory. Virtual memory is advantageous if it's used correctly, but if misused, it can be more a hindrance than a help.

We tested Virtual with 2- and 5-megabyte machines, and performance was good in both cases. If you already have 4 or 5 megabytes, you can still benefit from Virtual because most of your work will be done in RAM and you'll swap only

when you switch applications. The time it normally takes to switch from one application to another under MultiFinder is far outweighed by the additional time it takes Virtual to swap data between the disk and RAM.

Version 2.0, which should be available by the time you read this, offers 9 megabytes plus 1 megabyte for every unused NuBus slot in your Mac. On a IIx with a video card installed, Virtual 2.0 lets you access 14 megabytes (9 megabytes + 5 free NuBus slots = 14). Other features of 2.0 are an installer that makes a contiguous swap file for you, and a Control Panel interface that lets you determine how much RAM you want to have (you don't have to use 14 megabytes).

Virtual 1.05 is solid, and most incompatibilities with other products have been ironed out. Although the proliferation of 4-megabyte SIMMs may cut into the market for virtual-memory products that simulate the real thing, these new SIMMs are rare and expensive and are likely to stay so for some time. Real RAM will always be faster, but as a cost-effective way to extend the range of your Mac, Virtual is ideal.

— Stephan Somogyi

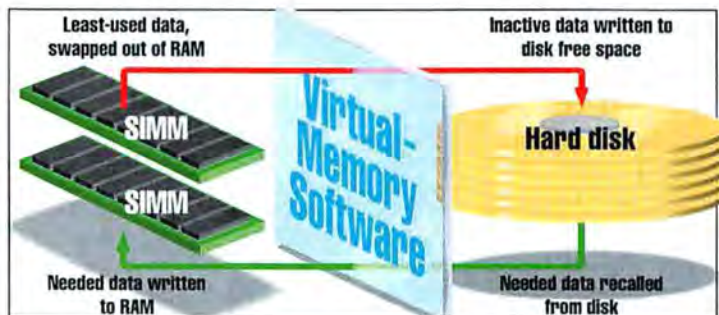
[As we went to press, Connectix announced a price change. Effective with Virtual version 2.0, the price for the product, including a PMMU, will be \$275. — Ed.]

Virtual Memory

Using special PMMU instructions that either the 68851 (an option for the Mac II) or the 68030 chips can understand, a Mac can be told how much memory to think it has; the maximum limit is determined by the System file. Even if only 5 megabytes of RAM are installed, you can tell the PMMU to act as if there were 8 megabytes.

But even with virtual memory running, the "real" RAM in the machine is used up first. Sooner or later, some of the memory that isn't really there will need to be accessed. This is when the PMMU activates the virtual-memory software.

The virtual-memory program remembers which parts of RAM have been unused the longest; it then swaps the RAM's contents to the hard disk (the action of swapping is sometimes also referred to as paging). Once the data has been saved to disk, the PMMU instructs the Mac that the newly freed space is available. When the Mac needs the memory that's been swapped to disk, the virtual-memory software uses the same method of swapping out the least-used data being held in RAM for the required data being recalled from disk. It's slower than real RAM but also cheaper.



Virtual memory, which Apple says will be a part of System 7, is a software process that reuses real RAM and available hard-disk space in a "swapping" method that lets the computer operate as if it had more memory than it really does.

Get Info

Virtual ★★★★★1/2

List Price: \$545 (includes PMMU); \$199 (without PMMU, for all 68030-based Macs, or for Macs equipped with accelerators from Dove, DayStar Digital, SiClone, Levco, or Irwin).

Published by: Connectix Corp., 125 Constitution Drive, Menlo Park, CA 94025; (415) 324-0727.

Version: 1.05.

Requires: 2 megabytes highly recommended; 8 megabytes contiguous hard-disk space; System 6.0.2 recommended.

Application Size: 10K.

Compatibility: Mac II equipped with PMMU, 68030-based Mac, or accelerated Mac with PMMU capability.



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UTILITIES

JetLink Express and MacPrint

Macs can now print on Hewlett-Packard non-PostScript printers, but there are drawbacks.

 Most laser printers sold are not PostScript printers. By far, the majority are either made by Hewlett-Packard or are compatible with the HP LaserJet or DeskJet series. It was only a matter of time, therefore, before someone developed a product that let you print from a Mac to the ubiquitous HP non-PostScript printers.

WHAT THEY ARE So now we have two products that do just that: JetLink Express, from GDT Softworks, and MacPrint, from Insight Development. Both products provide a special printer driver that you copy into your System Folder and then open in the Chooser DA. After that, the similarity ends, because each has its own strategy for printing Mac text and graphics to an HP printer.

MacPrint's approach to fonts is twofold. First, it has screen fonts for every

imaginable HP font cartridge so that you can use an internal printer font just as you would any other. The advantage is extremely fast printing at top quality. The catches are that you're restricted to the installed sizes and that most of the Mac's special characters aren't available. (Missing characters appear as rectangles.)

If you need larger characters or special symbols, you must use MacPrint's second approach: Install and use any of the special Compugraphic screen fonts provided. These fonts are like any others, except that they come in a wide range of very large sizes. This allows the driver to use a size larger (ideally, four times larger) than desired and scale it down to achieve high resolution. The result is usually high quality but longer print times.

JetLink Express takes a different approach. It provides a set of four special

outline fonts that it automatically uses when you choose the standard Adobe Times, Helvetica, Courier, and Symbol fonts. (You can pay \$198 for seven more faces.) The outlines let you use any size from 3 to 127 points. If no outline is available, JetLink tries to use a quadruple-sized screen font to generate the characters needed. Only when you print in Draft mode does JetLink resort to using the HP printer's cartridge fonts — often with unfortunate results.

HOW THEY WORK Both products include a cable, support landscape printing, work with SuperLaserSpool, and let you print envelopes. JetLink has a few more options — such as automatic font substitution, support of outline style (neither supports shadow), and flipping and inverting images — than does MacPrint.

The manuals are glaringly different: MacPrint's is detailed and helpful; JetLink's is just plain awful. It doesn't even tell you how to set the LaserJet's DIP switches (you have to run to your printer manual to figure it out). To add insult to injury, the JetLink manual has whole chapters of totally irrelevant material and then fails to provide an index.

Be warned too: Neither product works flawlessly — especially with graphics programs. Be sure to confirm that your favorite programs are supported before you buy (troublesome programs include MacDraw II, Illustrator 88, FreeHand, and SmartForm Designer). Moreover, I

- a. "Either those drapes go, or I do." — *dying words of Oscar Wilde*
[MacPrint, LJ Times font (cartridge F), 10 pt., High quality, print time: 9 secs]
- b. "Either those drapes go, or I do." — *dying words of Oscar Wilde*
[MacPrint, CS Times font (4X method), 10 pt., High quality, print time: 16 secs]
- c. "Either those drapes go, or I do." — *dying words of Oscar Wilde*
[MacPrint, CS Times font (screen resolution), 10 pt., Low quality, print time: 4 secs]
- d. "Either those drapes go, or I do." — *dying words of Oscar Wilde*
[JetLink, Times font (substitutes its own outline version), 10 pt., 300 dpi, print time: 11 secs]
- e. "Either those drapes go, or I do." — *dying words of Oscar Wilde*
[JetLink, Times font (screen resolution), 10 pt., 75 dpi, print time: 3 secs]
- f. "Either those drapes go, or I do." — *dying words of Oscar Wilde*
[JetLink Times font (uses cartridge font), 10 pt., draft print time: 7 secs]
- g. "Either those drapes go, or I do." — *dying words of Oscar Wilde*
[JetLink, Times font (uses cartridge font), 12 pt., draft, print time: 3 secs]
- h. "Either those drapes go, or I do." — *dying words of Oscar Wilde*
[Apple driver, Times font (uses PostScript font), 10 pt., print time: 18 secs]

- (a) Using the HP-resident fonts with MacPrint lets you print quickly and cleanly, but unusual characters (such as the curly quotation marks in this example) are not supported.
- (b) MacPrint gives you screen fonts from Compugraphic in jumbo sizes to let you print high-quality Times, Helvetica, Courier, and Symbol. This method takes longer to print.
- (c) MacPrint's lowest-quality printout matches the screen dot for dot. It's fast but ugly.
- (d) JetLink substitutes a special outline Times font that looks good in sizes up to 127 points.
- (e) JetLink lets you choose the number of dots per inch. At 75 dpi, you get a printout only as good as the screen, which is not so good.
- (f) In Draft mode, JetLink uses the printer's internal-cartridge fonts and matches the screen size to the closest cartridge size. But because the 10-point HP cartridge font is larger than the 10-point Mac screen font, the words overlap.
- (g) Printing at 12 point fixes the problem.
- (h) For comparison, here's the same text printed on a LaserWriter Plus.

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encountered a mysterious incompatibility in an ordinary-looking System Folder when I first tried to use JetLink's outline fonts.

A recommendation? It's pretty much a draw. If you have a large investment in LaserJet font cartridges, you'll probably prefer MacPrint, which makes better use of them than JetLink does. On the other hand, if you need lots of type sizes, JetLink's outline fonts are a clear improvement over MacPrint's fonts, which restrict you to the installed sizes. Both products get the job done; just don't expect life to be as smooth as it would be if you had a LaserWriter.

— Dave Vallulis

Get Info

JetLink Express

List Price: \$149.

Published by: GDT Softworks, 4664 Lougheed Highway, Suite 188, Burnaby, British Columbia V5C 6B7, Canada; (800) 663-6222.

Version: 1.0.1a.

Requires: LaserJet IID, LaserJet II series, LaserJet Plus, DeskJet Plus, DeskJet, or any printer fully compatible with these HP printers; hard-disk drive; 512K printer memory (1 megabyte recommended); System 6.0 or later.

Application Size: Driver, 82K; outline fonts, 453K.

Compatibility: Mac Plus or later.

MacPrint

List Price: \$149.

Published by: Insight Development, 2200 Powell St., Suite 500, Emeryville, CA 94608; (415) 652-4115.

Version: 1.1.

Requires: LaserJet IID, LaserJet II series, LaserJet Plus, DeskJet Plus, DeskJet, or any printer fully compatible with these HP printers; 512K printer memory (1 megabyte recommended); System 5.0 or later.

Application Size: Driver, 74K; Compugraphic screen fonts, 1.3 megabytes (about 20K of screen fonts per cartridge).

Compatibility: Mac Plus or later.

LANGUAGES

Anatool

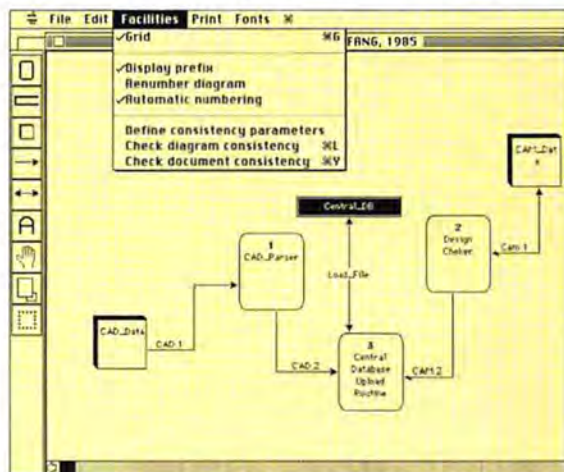
For software engineers seeking a data-flow-diagramming tool, this is it.

The point of CASE (computer-aided software engineering) is to remove the inconsistencies of hacking from software development. The first level of added sophistication is the DFD (data-flow diagram). With DFDs, system analysts describe the flow of data into and out of a system with a series of boxes that represent processes, files, or elements outside the system being designed. With a graphic depiction of a system, analysts and users can establish a common ground for future changes and discussions.

Once the pictures have been drawn, DFDs act as a bridge between design and coding by allowing analysts to include a central data dictionary and pseudocode specifications for software modules. In most CASE scenarios, DFDs are the glue that binds the design, analysis, and coding segments of the software engineering. Anatool does a splendid job of bringing DFDs to the Macintosh.

WHAT IT IS Anatool's DFD design window supports the Gane and Sarson DFD technique. This technique is primarily different from that of Yourdon and DeMarco, the other popular DFD methodology, in the design of symbols and consistency-checking rules. All DFD techniques were developed first for paper systems and have only recently become associated with CASE. It's the computer's ability to store and display complex information that has unleashed the recent boom in the structured-analysis and -design market. To begin a DFD with Anatool, the analyst must first draw the Level 0 diagram. Level 0, also known as a context diagram, acts as an overview. To place an element on a DFD page, you simply drag it off a menu. Each process

block (a square with rounded corners) becomes a system component that the analyst explores. Double-clicking on a process block invokes a dialog box that requests a choice between Data Flow



Anatool is a powerful CASE tool for the creation of DFDs (data-flow diagrams), which illustrate the flow of data through a system design. The rounded rectangles are process modules that represent data transformations within the system, the shadowed rectangles are external entities that are outside the system's scope, and the dark rectangle is a data store that holds needed data.

Diagram or Mini-Specification. Choosing Data Flow Diagram brings up a new drawing window with the input and output portions of the current process already visible. Selecting Mini-Specification displays a text-processing window into which you can enter structured English pseudocode.

The DFD tools include a process block, an external entity, a stores block, data-flow connectors, a text tool, a hand for moving around the window, and reduction and selection tools. Process blocks are used to represent the transformation of data in a system. These hierarchical elements can run many levels deep, with each level expressing a finer degree of detail. At the bottom of the hierarchy is the Mini-Specification window, which transforms the abstraction of graphics

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utilities package featuring data recovery, deleted file recovery, DES encryption security, and a powerful backup program.

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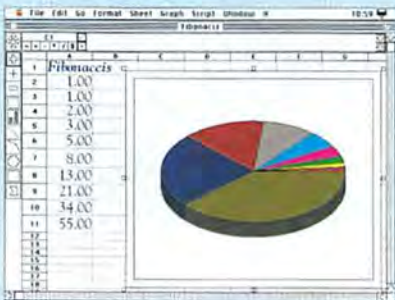


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Up to Date

Changes New and Noted

WINGZ 1.1 adds more number formats and expanded surface-graph options to its spreadsheet as well as improvements in its HyperScript application-construction language. The upgrade also features new documentation — including a comprehensive HyperScript manual — although registered buyers of version 1.0 (who will automatically receive the software update) must purchase the new manuals separately for \$37. \$399; upgrade, free to registered owners. Informix Software, 16011 College Blvd., Lenexa, KS 66219; (913) 599-7100.



PERSONAL LASERPRINTER, BUSINESS LASERPRINTER, AND WRITEMOVE PRINTERS

from GCC Technologies have new driver software (version 2.2 for the PLP and 1.2 for the WriteMove), more fonts (Headliners and Publishers' Choice for the PLP and WriteMove, priced at \$239 apiece), and new factory-direct pricing options (PLP, \$1,699; BLP, \$3,299; and WriteMove, \$579). Also due out by the time you read this are a new sibling (the \$699 WriteImpact dot-matrix printer); support for the Adobe Type Manager; and several new utilities, including a font converter for Bitstream's MacFontware and an envelope-handler/address-database DA. GCC Technologies, 580 Winter St., Waltham, MA 02154; (617) 890-0880.

PLUS, the German HyperCard "extension," has been upgraded to version 1.11 and has a new American distributor. Spinnaker Software, One Kendall Square, Cambridge, MA 02139; (617) 494-1200. \$199; upgrade, free to registered owners.

into concrete process descriptions. The system automatically numbers process blocks according to the Gane and Sarson rules.

The stores block illustrates disk storage or other temporary files. The external entity describes things beyond a system's control that somehow affect, or are affected by, the system's actions. Single or bidirectional connections can be made among any objects in a DFD. The connectors represent data flow within the system.

Once you've done your design homework, Anatool checks your work. In the DFD methodology, every entity and link must have a name. These names are stored in the central data dictionary, which makes structured analysis and design a valuable systems communications tool by creating a central repository of data elements.

Double-clicking on a store icon or a connector invokes the dictionary. The Anatool Data Dictionary holds data definitions for data structures such as files, basic data such as employee numbers and hourly pay rates, and known data (an accumulator for data elements that require no further definition, such as a robot arm or a letter).

The Data Dictionary contains all the names used in the DFD, including processes. If a Data Dictionary item is known by more than one name, it can have multiple aliases in the system that refer back to the original definition.

Anatool's flexible data structures include basic data elements; sequences of items that describe a file; or repeatable elements, such as items on a sales check. Basic data elements can be assigned minimum, maximum, and typical values or a table of acceptable values.

The details of basic elements and files are an Anatool weakness. Low-level data descriptions should have a richer tapestry on which to hang the myriad data types, constraints, and file structures in modern languages. For large multianalyst projects, the Data Dictionary MIX application, which accompanies Anatool, merges data dictionaries from project teams or allows ASCII files to be imported from other products.

HOW IT WORKS Anatool's components are well integrated. Double-clicking on any active element in the system immediately brings you to the detail behind it. But this is also an Anatool flaw. When you change a higher-level DFD description, the underlying diagram does not

change, which makes fluid designs difficult to model. For top-level elements to be displayed accurately in a lower-level diagram, the complete lower-level structure must be removed and recreated as a new diagram. I would like to see future versions of Anatool add dynamic mapping of higher-level constructs to their detail levels.

The consistency-checking routines in Anatool keep you honest. Everything in a DFD must be defined by the Data Dictionary. Every process must have a name, and every data flow, a definition. Data elements, even those not directly on the diagram, must be properly defined; Anatool forces you to produce thorough documentation. If you haven't finished your work, it has no qualms about telling you so.

Anatool's documentation is compact and complete. Advanced Logical Software has included a chapter that covers structured analysis and design, but this cursory examination serves only as an appetizer for hungry systems analysts. (If you really want to satiate your palate and see where this tool is leading you, get a copy of Alan Fisher's book *CASE* [New York: Wiley, 1988].)

For those of you hoping for a graceful entry into CASE, Anatool is the right product. Advanced Logical Software has given the Macintosh a good DFD tool at a reasonable price. If you think \$925 is expensive, take a good look at the market. Many other Macintosh tools make data-flow diagramming a frustrating experience. Anatool's combination of simple menu structures and accessible features illustrates what good top-down analysis provides: very usable software.

— Daniel W. Rasmus

Get Info

Anatool

List Price: \$925.

Published by: Advanced Logical Software, 9903 Santa Monica Blvd., Suite 108, Los Angeles, CA 90212; (213) 653-5786.

Version: 3.1.

Requires: Two 800K drives; hard-disk drive recommended.

Application Size: 364K.

Compatibility: Mac 512KE or later.

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Two or three years from now, the typical laser printer will be a lot like the Business LaserPrinter™: small, light, with a SCSI connector for a hard disk, and inexpensive."

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WORD PROCESSING

Language Master

A new dictionary-thesaurus DA redefines the meaning of 'look it up.'

 You know those hand-held electronic dictionaries found in yuppie catalogs such as that from The Sharper Image? Well, the information they contain is now available in a DA called Language Master, a disk-based dictionary and thesaurus.

The original hand-held Language Master from Franklin Computer is based on linguistic code developed by Proximity Technology, the owner of the electronic rights to Merriam-Webster's dictionaries and thesauruses. Franklin Computer liked the code so much that it bought the company and founded Franklin Software to market its programs. The

code has also been licensed to other software vendors for inclusion in their own applications, such as Deneba's Spelling Coach Professional.

WHAT IT IS Language Master is an on-disk dictionary and thesaurus — not a spelling checker. (If you want a spelling checker, see "Checking Spellers," September '88.)

The dictionary contains definitions, hyphenation points, and information about parts of speech for more than 83,000 English words. The thesaurus has 40,000 unique entry points with synonym information for different parts of speech.

Language Master comes on three 800K

disks with a utility to install the DA and data files into the System of your choice. Because the files are so large, a hard disk is required.

After you select Language Master from the Apple menu, "LM" appears at the far right of the menu bar. From this menu, you can look up definitions or synonyms, change keys for commands, and specify the position of the Language Master window.

HOW IT WORKS Highlighting a word in a document and choosing Lookup Definitions from the LM menu brings up a modal dialog box with definitions in a scrollable window six lines deep. The dictionary and thesaurus share a fixed-sized window, so you can't display both simultaneously or take advantage of larger screens to display longer entries in their entirety.

If a highlighted word is spelled incorrectly or can't be found in the dictionary, alternative spellings are suggested, based on phonetic and typographic correction algorithms. To replace a suspect word in



Where will your electronic mail system



Some people see electronic mail as a simple desktop utility for shooting messages down the hall. Period.

Microsoft, however, sees it as a strategic business investment that should dramatically boost communica-

tion and productivity five minutes after installing it. And five years after running it.

Introducing Microsoft® Mail version 2.0—the only company-wide electronic mail system built so you won't outgrow it. Now you can instantly send messages and files Mac® to Mac, Mac to PC, Mac to

a document, you click on the replacement word and then click on the Replace button.

Language Master is unique in that the words in the thesaurus are properly inflected to match the selected word's usage. For example, if you ask for synonyms for *jump*, it shows you *leapt*. If the word is *jumped*, the response is *leapt*. You can therefore rest assured that replacements make sense in context.

You can also copy complete definitions and synonym lists into your documents via the Clipboard. For students of the English language, this feature is a godsend because you can retrieve a definition and then paste it into a word-processor file that you can print to create a simple flash card.

If you want to investigate further any word in the definition or synonym box, simply double-click on it and a new list appears. This cross-referencing feature makes Language Master ideal for investigating the richness of the English language.

mas-ter

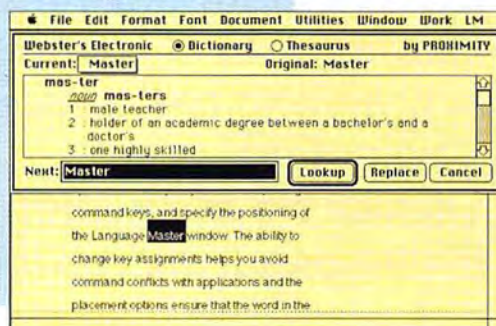
noun mas-ters

- 1 : male teacher
- 2 : holder of an academic degree between a bachelor's and a doctor's
- 3 : one highly skilled
- 4 : one in authority

verb mas-tered; mas-tered; mas-ter-ing; mas-ters

- 1 : subdue
- 2 : become proficient in

- mas-ter adjective
- mas-ter-ful adjective
- mas-ter-ful-ly adverb
- mas-ter-ly adjective
- mas-ter-ly adverb
- mas-ter-ship noun
- mas-tery noun



Language Master is an on-line dictionary and thesaurus that packs the same technology as in the hand-held models available from The Sharper Image. Language Master's windows can't be resized, but the rear screen shows the complete text that's available through scrolling.



System be five years down the road?

VAX®, potentially Mac to whatever. And, for the first time ever, you can send and receive mail directly from Macintosh® programs like Microsoft Excel and Microsoft Word—it's never been *this* convenient.

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Grappler[®] LX

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- ✓ A premium performance printer interface
- ✓ Cholesterol free
- ✓ Leaves no sticky film
- ✓ High speed, microprocessor driven, attractively priced!

O.K. so it won't do all the above, but it is new and improved, and it will let you use the printer you want with your Macintosh™. Announcing the *Grappler LX*, the latest advance in Macintosh printer interfacing! Over the past 9 years, the Grappler name has been synonymous with innovation and excellence. This tradition has now created the pinnacle of Macintosh printer compatibility and performance.



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We've optimized the speed and efficiency of the *Grappler LX* to insure that you get peak performance from your laser, inkjet, or 24 pin dot matrix printer. The *Grappler LX* adjusts to the printer in use to provide the best possible output in the least possible time.

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To ensure quick, trouble-free installation, the *Grappler LX* includes a new AutoInstaller. Just point and click, and the *Grappler LX* will be ready to print from any Macintosh Plus, SE, SE/30, II, IIx, or IIcx computer in just a few minutes.

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With virtually all printer technologies supported, the *Grappler LX* can serve your every interfacing need!

More Fantastic Fonts!

Five fonts are included as standard with the *Grappler LX*. You'll be able to enhance documents and clarify correspondence with new emphasis and flair. You can now use Swiss, Courier, Dutch, Garamond, and Zapf Chancery Medium Italic in a variety of sizes.

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The new *OrangePort* allows *Grappler* users to print over

AppleTalk networks. Now an entire network can share *Grappler*-compatible printers. The *Grappler 9 Pin* provides owners of Epson-compatible dot matrix printers a cost-effective method of printing directly from the Macintosh. For economy-minded Hewlett-Packard LaserJet and DeskJet Plus owners, the *Grappler LS* provides Macintosh printer compatibility. For additional fonts, try *AlphaBits*, a collection of seven popular typefaces.

With nearly 1 million Apple printer interfaces sold, Orange Micro sets the pace in compatibility solutions. Call a local Apple Authorized dealer or Orange Micro today to receive additional information or to order the *Grappler LX*.



1400 N. Lakeview Ave., Anaheim, CA 92807
(800) 223-8029, In CA (714) 779-2772

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© Orange Micro, Inc., 1989

Please circle 20 on reader service card.

Language Master has a wildcard feature that lets you search for words in which you've substituted question marks for any number of unknown letters. Unfortunately, you're restricted to words that specifically match the number of characters you've entered, so *p???*, for example, finds only four-letter words that start with *p*.

As mentioned earlier, Language Master shares its lexicographical information with other programs, most notably Denzba's Spelling Coach Professional. But Coach is a full-fledged spelling checker that costs \$199, whereas Language Master is an on-disk dictionary and thesaurus at half the price. It presents information in a much more readable format than Coach does, and its thesaurus is more useful because it contains inflections, not just root words. On the other hand, Coach provides antonyms and Language Master doesn't.

With a few minor improvements, such as the addition of antonyms, resizable windows, and a user-definable dictionary that could be particularly useful for businesses with specialized terms, Language Master would be a must-have for those who work with words. As it is, this is a useful, reasonably priced utility that's worth looking into if you're tired of constantly leaving your Mac to thumb through your old copies of *Webster's*. Although I doubt that Language Master will ever replace the printed reference books it emulates, it may give The Sharper Image a run for its money.

—Owen W. Linzmayer

Get Info

Language Master

List Price: \$99.

Published by: Franklin Software, 3511 N.E. 22nd Ave., Fort Lauderdale, FL 33308; (800) 543-3511 or (305) 566-3511.

Version: 1.0.


Requires: System 4.2 or later; Finder 4.0 or later; 800K disk drive and hard-disk drive.

Application Size: DA, 114K; Dictionary file, 1.1 megabytes; Thesaurus file, 352K.

Compatibility: Macintosh Plus or later.

Rumor Manager

Gossip, Guesses, and Goings-On


 By now you've had a chance to try out the Macintosh Portable. Don't get too attached to it. There will be anywhere from two to four more Mac portables in 1990 — some may even be real laptops. The first one will show up very soon after Motorola figures out how to make CMOS (low power) 68030 CPUs in reasonable quantities at reasonable prices. Current samples are hard to come by and very pricey.

In the slightly longer term, you're likely to see a really small notebook computer. Its arrival hinges on the new CMOS CPU and some new battery technology. The research that Rumor Manager previously reported on is coming along fine, and another interesting approach, being prototyped in Cupertino, California, at the time of this writing, is a portable powered partially by light and partially by wafer batteries. The light source can be as weak as a halogen-bulb penlight.

Color is a possibility by the end of the year, although the middle of 1991 seems more likely. Apple Computer is also doing lots of work on a low-power backlit screen. This could be available by midsummer and might also be sold as a retrofit (a very expensive retrofit to be sure) for current Portables.


And Apple may not be alone in its portable endeavors. Don't be surprised if the folks in Cupertino team up with a certain Japanese electronics firm to come up with a truly portable portable. The grapevine throughout the Valley is already buzzing with rumors of a small, light, powerful unit that will put DOS portables to shame and that could even put a big dent into the Mac Portable itself.

If this project proceeds as rumored, it'll be interesting to see if Apple once again pursues its policy of competing with itself — even before its new CPUs get a chance to catch on.


 The new decade will have much more going for it than lots of new entries in the portable line. The "transportable" line — Pluses and SEs — will be revamped,


with the Plus and SE being dropped in favor of new machines. The low-cost replacement for the Plus, the Iles, and all other cheap Apple computers could be out by the end of March. It will have a built-in monitor and will cost \$995. The new high-end box will have video, EtherTalk, and more — all in a small case. The screen and internal video will be interesting, as they will support 24-bit color.


The middle-of-the-line machine is still being planned, but it's most likely to be an SE/30 with much cleaner and better internal engineering.

 The modular family will get several new and faster machines. The much-talked-about F19 should be first. Its speed will again depend on what Motorola can deliver: 33 megahertz is certain; 50 or 65 megahertz is possible.

This fastest Macintosh will look a lot like a IIx but will be more like a IIci in internal design. It will be able to use 100-nanosecond or maybe even 120-nanosecond RAM without affecting performance. Caching technology has really come a long way recently.

 The on-again, off-again Tower project is on again. It's now going to be a dedicated server machine with a built-in tiny screen (5-inch diagonal) and small integral keyboard.

 Those are the predictions for the first half of the year. The end of 1990 could get really interesting.

 Heard any good rumors lately? If we use your rumor, we'll send you a token of our appreciation and promise not to use your name. Anonymous contributions are also accepted.

Our U.S. Mail address is Rumor Manager, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Our electronic addresses are MacUser (on MCI Mail), 70411,204 (on CompuServe), and MacUser.Edit (on AppleLink). No calls, please.

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Color Extension	175.	
Aldus Persuasion	369.	
PageMaker 3.01	385.	
Ashton Tate		
FullWrite Professional	249.	
Broderbund		
DTP Advisor	47.	
Caere		
OmniPage	545.	
Letra Studio	269.	
LetraFonts (Various Vol. 1-45 ea.)	65.	
Microsoft Microsoft Word 4.0	249.	
New Horizon		
WordMaker	Special 65.	
Niles & Associates EndLink	58.	
EndNote	75.	
Paragon Concepts		
Nisus v3	Special 245.	
Preferred Publishers		
Vantage	54.	
Prescience Expressionist 2.03	79.	
Quark, Inc. QuarkXPress V2.12	469.	
QuarkStyle	175.	



Micro Planner 6.1 by Micro Planning Int.

Micro Planner is the highest rated project management software and "The Choice for Corporate America" according to MacUser magazine (October 1989). **Micro Planner** is a powerful yet easy to use project management program that uses critical path (PERT) and powerful resource management capability to help managers get projects done on time and on budget. **\$325.**

WORD PROCESSORS & DESKTOP PUBLISHING (CONTINUED)

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MacWrite II	185.	
Design Science		
Math Type 2.0	95.	
Emerald City		
Smart Art I Text Effects	85.	
Smart Art II Graphic Effects	85.	
Smart Art III Advanced Text Effects	85.	
Exodus		
Expresswrite	65.	
Letraset		
Design Studio 1	459.	
Ready, Set, Go! 4.5	269.	
Silicon Beach Personal Press	199.	
Symantec More II	249.	
Symmetry Acta Advantage	65.	
T/Maker Company		
WriteNow V2.0	109.	
TimeWorks Publish-It	219.	
U.S. MicroLabs		
Font Sizer	69.	
Word Perfect Corporation		
Word Perfect	185.	
Working Software		
Findswell	36.	
QuickLetter	73.	



Number Maze by Great Wave Software

Number Maze combines the fun of solving mazes with the challenge of solving math problems. Includes math levels from simple counting and picture edition for young children to multiplication, division, and word problems for older children. **\$26.**



Liaison by Infosphere, Inc.

Liaison is the software-only solution for connecting AppleTalk networks, locally or remotely. Dial into AppleShare, MacServe, or TOPS. Access your E-mail anywhere, anytime. Split Local-Talk nets for better performance. Even print to a LaserWriter from EtherTalk. **Liaison** combines cost effectiveness with maximum flexibility, performance and impregnable network security. 1989 Mac-User Eddy winner. **\$169.**

NETWORKING SOFTWARE & HARDWARE

CE Software In/Out (5 user pak)	129.	Microsoft Mail Mac Work Station	84.
In/Out (10 user pak)	189.	Nuvotech	
Quick Mail 1-5 users	169.	TurboNet ST (Din8 or DB9)	30.
Quick Mail 1-10 users 2.0	249.	TurboBridge	309.



Mac Pro Keyboard by Key Tronic

Power-on your Mac with a keyboard that feels better, lasts longer and offers more features for your money. Key Tronic's new ADB-compatible 105-key **Mac Pro** features a large, L-shaped Return key for faster data entry with fewer errors. Dual-legend keycaps assure ease of operation. Plus, you get Tempo II, the award-winning macro package — absolutely FREE. Backed by a three-year warranty. **\$119.**

NETWORKING SOFTWARE & HARDWARE (CONTINUED)

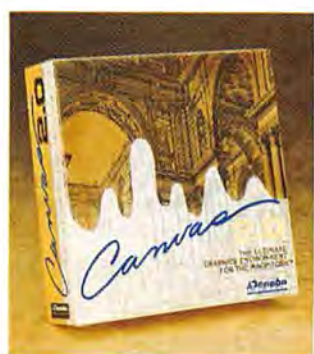
Dove		Olduvai Software	
FastNet III or FastNet SE/SE30	369.	Clip Share	109.
FastNet SCSI	745.	Orange Micro	
Farrallon		OrangePort	209.
PhoneNET AppleTalk	8.	Shiva	
PhoneNET Din 8 or DB9	33.	NetModem V2400	425.
Timbuktu	95.	Net Serial X232	279.
TrafficWatch	129.	Net Bridge or TeleBridge	339.
Timbuktu Remote	129.	Tactic Software	
PhoneNET Repeater	319.	Font Share	149.
PhoneNET Star Controller	1095.	TOPS Tops 2.1 Mac	145.
LaCie Silverserver	85.	Tops Dos or Net Print	114.
Magnus		Tops FlashBox	125.
FileMagic	49.	Tops Repeater	129.
Microcom Software		Tops FlashCard	159.
Carbon Copy	119.	InBox-MacConnection	45.
Microsoft		InBox-Starter Kit	149.
Microsoft Mail Mac Server	255.	Tops Teleconnector Din8 or DB9	29.



DocuComp by Advanced Software

DocuComp compares different versions of a word processing file or programmer's code. Frustrated with marking up hard copy? No More! **DocuComp** reports changes as minor as added commas or as major as a complete rearrangement and lists all changes by page and line number. **DocuComp** is being adopted as a standard in Fortune 500, government, writing, legal and academic circles. **\$89.**

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Canvas 2.0 by Deneba Software

Canvas 2.0, one of the top graphics programs, includes many new features: unlimited layers, positioning to 1/64,000 inch, Bezier curves and polygons, and 16.7 million colors on the Mac II. Converts bit mapped images into objects. **Canvas 2.0** rivals CAD programs. For business graphics, presentations, desktop publishing, engineering or architecture, **Canvas 2.0** helps you create. **\$169.**

MODEMS

Abaton		Prometheus	
InterFax 12/48	265.	Promodem 2400M Ext.	
Anchor Automation		(MacKNOWLEDGE & Cable)	199.
MacPac 2400E w/software & cable	169.	Promodem 2400SE Int.	
Applied Engineering		(MacKNOWLEDGE & DA)	209.
DataLink Express	Special 189.	Promodem 2400M Int. (II, IIX, ILCX)	
Best Data Products		(MacKNOWLEDGE & DA)	269.
SmartOne 2400/1200		Promodem 9600M Plus Ext.	
w/software & cable	Special 145.	(MacKNOWLEDGE & Cable)	750.
Hayes Microcomputing		Promodem 2400M Fax	Special 209.
Smartmodem 2400M w/smartcom II	429.	Supra Corporation	
Practical Peripherals		Supra Modem 2400	115.
Practical Modem Mini 1200SA	77.	STF Direct	
Practical Modem 2400SA	179.	FAXstf	445.
MacCompack (2400SA		U.S. Robotics	
w/Microphone & Cable)	225.	Courier HST 9600 Dual Standard	999.



MacLuggage for the Mac SE by I/O Design

MacLuggage features a tear and soil resistant Corcra outer shell and ultra-high density foam. It has compartments which holds mouse, cords, extended keyboard and external hard drive. Comes in navy, platinum and black. **\$69.**

DESK ACCESSORY PROGRAMS

Affinity Microsystems		Smart Alarms Multi-User Appt. Diary	
Tempo II	Special 75.	(1-4 users)	99.
Affinityfile	42.	Smart Alarms Multi-User Appt. Diary	
Casady & Greene, Inc		(5-8 users)	149.
QuickDex 1.4A	31.	Smart Alarms Multi-User Appt. Diary	
CE Software DiskTop v4	65.	(9-15 users)	199.
Deneba Software		Solutions, International	
Comment 2.0	58.	Super Glue II	61.
Icom Simulations MacKern	114.	SmartScrap & The Clipper V2.0	45.
Jam Software		Symmetry	
Smart Alarms w/Appt. Diary	49.	HyperDA (Req. 512K)	Special 49.

2400MFAX by Prometheus

The **2400MFAX** is part of the new ProModem Data/Fax Series. The **2400MFAX** adds Group III, originate-only, 4800 bps fax capabilities to a 2400 bps data modem at a price comparable to standard 2400 bps modems. Get the convenience and flexibility of your own personal data and fax modem whether at the office, home or on the road. The **2400MFAX** Data/Fax modem includes two popular software packages, BackFax and MacKNOWLEDGE. **\$209.**



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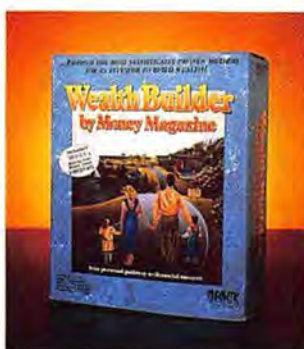
Go Master by Toyogo

Go: the oriental strategic board game originated in China 4,000 years ago. "If you are looking for a captivating game suitable for children or mathematicians...I strongly recommend you try the Nemesis software." Modern Electronics. **\$49.**



DATABASE MANAGEMENT

Acus 4th Dimension v2.0	469.	MBA Massmail	115.
4th Dimension (Free Upgrade)	339.	MBA Netmail	115.
Activision		MBA Personnel	115.
Reports for Hypercard	65.	MBA Projects	115.
Apple Computer		MBA Ship rec.	115.
HyperCard	42.	MBA Telesell	115.
Blyth Software		MBA Travelog	115.
Omnis 5	347.	Icom Simulations	
Borland Reflex Plus	185.	Formulator	89.
Claris FileMaker II	219.	Microsoft	
Exodus		Microsoft File 2.0	125.
Retriever	59.	Microsoft Office (includes Excel, Word, PowerPoint & Mail)	529.
Fox Software		Odesta Double Helix III	339.
FoxBASE+ v2.0	Special 279.	DataDesk Professional	285.
FoxBASE+ Multi-User v2.0	355.	GeoQuery	198.
FoxBASE+ Runtime v2.0	155.	Preferred Publishers	
Generation Four		DAtabase	69.
Multiuser Business Administration Series:		ProVUE	
MBA Clients	115.	Panorama	199.
MBA DistList	115.	Software Discoveries	
MBA Docutrak	115.	RecordHolderPlus	64.
MBA Inventory	115.		



WealthBuilder by Money Magazine

WealthBuilder by Money Magazine turns your Mac into your very own financial planner. Taking into account your financial profile, the goals that you want to accomplish and the risks you are willing to assume, **WealthBuilder** recommends the best investments available to fulfill your objectives. Now for a limited time, buy **WealthBuilder** and get Quicken free (a \$59.95 value). **\$149.**



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Muzzle by Ergotron

The **Muzzle** prevents data tampering, application theft and virus infection. The **Mac II Muzzle (\$68)** locks the CPU cover protecting the internal hard drive/memory and expansion boards while the power cover prevents unauthorized use. The **Mac SE Muzzle (\$62)** secures either or both floppy drives while the power cover prevents unauthorized use. Protect your equipment today.

HYPERMEDIA & LANGUAGES

Bantam Publishing Complete HyperCard Handbook.....	22.	Microsoft Quick Basic	65.
Beacon Technology HyperBible King James.....	143.	Millennium Software HyperX.....	69.
Borland Turbo Pascal.....	68.	Olduvai Corporation Olduvai PLUS.....	Special 99.
Bright Star Technology Hyper Animator.....	99.	Power Up Hyper Tutor	29.
		Smethers Barnes Prototyper.....	187.
		SoftStream UltraSpec	95.



VocabuLearn by Penton Overseas

Dynamic foreign language program for the Mac! This interactive Hypercard Stack is available in five languages and two levels. Each program contains (2) 90-minute audio cassettes, complete word list and HyperCard Version 1.2.

HYPERMEDIA & LANGUAGES (CONTINUED)

Broderbund Whole Earth Catalogue (CD ROM).....	89.	Somak Software ScriptEdit.....	Special 51.
Consular Mac 68000 Dev. System.....	57.	Symantec Think C.....	155.
Digital, Inc. Mac 68020/030 Dev. System.....	99.	Think Pascal	95.
Smalltalk/vmac	125.	Just Enough Pascal	47.
Hyper Press Icon Factory.....	29.	TENpointO FocalPoint II.....	117.
Script Expert	45.	theResult Software Dialoger.....	Special 69.
Intelligent Developer	219.	Timeworks Hyperworks Organizer.....	57.
Icom Simulations HyperTMON.....	88.	Trendware Corporation Stack Cleaner.....	29.
Individual Software 101 Scripts & Buttons HyperCard.....	35.	HyperTools 1 or 2	52.
Manx Aztec C.....	62.	XCAL	79.
Aztec C Unitools	62.	T.M.L. T.M.L. Pascal II V3.0.....	109.
Aztec C + MPW	94.	T.M.L. Source Code Library II	39.
Aztec C + SDB	94.	Zedcore ZBasic 5.0.....	87.



MAC-101 Keyboard by DataDesk

Replace your Mac's keyboard with the **MAC-101** by DataDesk. The positive tactile, firm feel **101** includes a full numeric keypad, 15 function keys, 6 page control keys, and a T-style cursor pad. Includes 101-Keys desk accessory software, a powerful macro utility that allows you to exploit the full power of the function keys in almost any Mac application. Available in ADB and non-ADB versions. **\$139.**



Leprechaun by Shodan

Leprechaun lets you step into an enchanted world where you are the leprechaun king. A strategy game for everyone with 175 levels. Includes built-in editor, full color graphics and digital sounds. Macintosh Plus or later. **\$35.**

BLANK MEDIA

Double Sided 3 1/2" Diskettes BASF 3 1/2" DS/DD (box of 10).....	14.	3M 3 1/2" DS/DD Disks (box of 10)	15.
Bulk (Sony) 3 1/2" DS/DD (10)	14.	High Density 3 1/2" Diskettes Sony 3 1/2" DS/HD (10).....	29.
Centech 3 1/2" DS/DD Color Disks (10)	15.	Verbatim 3 1/2" DS/HD (10)	29.
Sony 3 1/2" DS/DD Disks (box of 10)	15.	Dolphin Flipper 44MG Cartridge	115.
Maxell 3 1/2" DS/DD Disks (box of 10)	15.	Peripheral Land Turbo 40 Cartridge.....	109.
Verbatim 3 1/2" DS/DD Disks (box of 10)	14.		



WordMaker by New Horizons

The new high performance, personal word processor for the Macintosh. **WordMaker's** intuitive design makes it easy to learn and to use. It has a fast WYSIWYG display, headers and footers for both left and right pages, color capability, multiple document support, a 100,000 word spelling checker, print merge, and more! You can even wrap text around irregularly shaped graphics. It reads and writes MacWrite files for compatibility. **\$65.**

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Awarded MacUser's Editors' Choice and InfoWorld's Product of the Year and selected for MacWeek's Top Ten New Products. **FoxBASE+/Mac** combines blazing speed, programming power and complete dBase compatibility. It's perfect for novices, demanding developers and power users. **FoxBASE+/Mac** has a form generator, application generator, complete template language system and a report writer. **\$279.**

DISK DRIVES/HARD DISKS/UPGRADES

1 Meg SIMMS	Call	Integra 60	799
Avatar Technologies MainFrame II	725	Integra 80	935
CMS		Dove Computer Marathon 030 Acc.	969
SD Ser. MacStack SD20U (Mac+/SE/II)	455	MSE 4 (16 Mhz w/1MB & Math Chip)	899
SD Ser. MacStack SD30U (Mac+/SE/II)	515	MacSnap 524E (512E to 1MB)	185
SD Ser. MacStack SD60U (Mac+/SE/II)	695	MacSnap 548 (512K to 2MB)	375
SD Ser. MacStack SD81U (Mac+/SE/II)	795	MacSnap 548E (512E to 2MB)	419
Platinum PD40 (Mac+/SE/II/III)	685	MacSnap 548S (512E to 2MB w/SCSI)	479
Connectix Virtual VM1	399	MacSnap Plus 2 (MacPlus to 2MB)	312
Virtual VM2	125	MacSnap 2SE or 1024 Option	312
Virtual VM3	125	SCSI Interface/Port	109



Dynodex by Portfolio Systems

Dynodex is the fast on-line personal database that easily prints double-sided address pages for Filofax and most organizer systems. Includes "no-fuss" laser paper and powerful database functions like find, sort, and select. **\$89.**

DISK DRIVES/HARD DISKS/UPGRADES (CONTINUED)

Cutting Edge		Epson	
Cutting Edge 800k Drive	149	Epson 40MB Internal	435
Under The Mac 20	Special 435	Epson 70MB Internal	549
Under The Mac 30	Special 499	Mass Micro Systems Datapak	1185
Under The Mac 45	Special 549	Data Cartridge (single)	125
Under The Mac 60	Special 625	Mobius Technologies	
Under The Mac 80	Special 735	MultiScreen Video Card	309
Removable 45MB Hard Drive	Special 899	Peripheral Land	
Dayna Communications		Turbo Floppy 1.44 Drive	355
Daynafile DF0100 Single	499	Infinity Turbo 40 MEG	1119
Dolphin Systems Flipper 44	1119	Personal Computer Peripherals	
Flipper 150MB Tape Backup	1249	Platinum Color Optional Built-In Modems	
Integra 20	499	MacBottom HD-45 (45MB SCSI)	779
Integra 30	575	MacBottom HD-70 (70MB SCSI)	999
Integra 40	759	MacBottom HD 84 (84MB SCSI)	1109



PLUS by Olduvai Corp.

The HyperCard upgrade you've been waiting for! **PLUS** features 256 colors, animation, cards and windows of any size, irregularly shaped buttons, full text styling and database fields, in a HyperCard-like environment. Program **PLUS** using PPL, an extension of HyperTalk that's fast and easy to learn. Use **PLUS** for presentations, education, multimedia, databases, personal productivity. Includes Introduction to Programming, Online Help and sample stacks. **\$99.**

GRAPHICS SOFTWARE

3G Graphics		Basic Home Design	32
Images w/Impact Graphics & Symbols	52	Bathroom Design	49
Images w/Impact Business 1	65	Comm/Residential Furnishing	32
Adobe Systems Adobe Illustrator 88	279	Flow Charts & Schedules	16
Streamline	229	Home Landscaping	16
Adobe Collector's Ed. 2	129	Kitchen Designs	49
TrueForm	225	Landscape Architecture	49
Newsletters	229	Graphsoft Mini Cad +	499
Forms & Schedules	279	Blueprint	Special 295
Presentations	279	Informix Wingz	259
Aldus Freehand	345	Innovative Data Design Dreams	262
Altsys Corp. Fontographer 3.0	249	Residential Construction	135
FONtastic Plus 2.02	51	MacDraft 1.2B	142
Art Importer	89	ISI Precision	155
Broderbund Print Shop	35	Klex Software MacConcept	Special 999
Poster Maker Plus	35	Letraset ImageStudio 1.5	269
Drawing Tables	75	MacroMind Macromind Director	445
Casady & Greene Vivid Impressions	67	VideoWorks Hyper Card Driver	60
Quill Pack (vol. 8 & 20)	89	VideoWorks Accelerator	118
Headline Pack (vol. 10-12)	125	VideoWorks II	175
Modern Pack (vol. 7, 14-18) or		Mansfield TableTools	269
Distinctive Pack (vol. 8, 19-22)	159	MathSoft MathCAD	305
Classic Pack (vol. 3-6, & 13)	159	Metro ImageBase Art Deco	85
CE Software Calendar Maker	32	Borders & Boxes	85
Claris MacPaint II	99	Business Graphics	85
MacDraw II	295	Computers & Technology	85
Claris Cad	595	Exercise & Fitness	85
Computer Assc. Cricket Draw	139	Food	85
Cricket Paint	59	Four Seasons	85
Cricket Graph	115	NewletterMaker	85
Cricket Color Paint	179	Nine to Five	85
Cricket Presents	285	People	85
Deneba Software Ultra Paint	125	ReportMaker	85
Canvas 2.0		Team Sports	85
(Includes Desk Accessory)	Special 169	Travel	85
Dream Maker Clippures (vol. 1 or 2)	65	Weekend Sports	85
MacGallery (Hypercard or Paint)	25	Micro: Maps MacAtlas Hyper Atlas	55
Dubl-Click Software		MacAtlas Paint v2.0	45
World-Class Fonts: Originals 1 & 2	42	QuickMap	55
World-Class Fonts: Stylized 3 & 4	42	MacAtlas Professional	
World-Class Fonts: Giants 5 & 6	42	(PLOT/MacDraw Version)	105
World-Class Fonts: Triples 7 & 8	42	MacAtlas Presentation Pack	105
World-Class Lasertype: 1		MicroSoft MicroSoft PowerPoint 2.1	249
Aukland, Calais, Metropolitan	42	Micro Spot MacInteriors	185
World-Class Lasertype: 2		MacPlot Color Thermal	339
Hoboken, Ixtapa, Saigon	42	MacPlot DMA Electrostatic	1715
World-Class Lasertype: 3 Versailles	42	MacPlot DMA Color Thermal	889
World-Class Lasertype: 4		MacPlot Electrostatic	685
El Paso, Tijuana	42	MacPlot Pen Plotter Professional	259
World-Class Lasertype: 5 Hancock Park	42	MacPlot Pen Plotter Standard	133
World-Class Lasertype: 6		Miles Computing	
Symbols Gabre, MathWhiz	42	Mac the Ripper or Orchestra of Fonts	32
World-Class Lasertype: 7 Frankfurt	42	People, Places-Things or Taking	
World-Class Lasertype: 8 Santa Monica	42	Care of Business	32
World-Class Lasertype: 9 Aspen	42	Mindscape Zing	125
WetPaint: Classic Clip Art (1 & 2)	42	NuEquation Nu Paint	88
WetPaint: Publishing (3 & 4)	42	Paracomp Swivel 3D	245
WetPaint: Animal Kingdom (5 & 6)	42	Model Shop	379
WetPaint: Special Occasions (7 & 8)	42	Preferred Publishers Exposure	54
WetPaint: Printer's Helper (9 & 10)	42	Silicon Beach Software SuperCard	128
WetPaint: Industrial Revolution (11 & 12)	42	SuperPaint 2.0	128
WetPaint: Old Earth Almanac (13 & 14)	42	Digital Darkroom	249
WetPaint: Island Life (15 & 16)	42	Super 3D 2.0	315
WetPaint: All the People (17 & 18)	42	SoftStream HyperHit	123
Electronic Arts Studio 8 (MacII)	299	Solutions International The Curator	72
Studio 1	97	Springboard Certificate Maker	18
Enabling Technology Clip 3D Accents	57	Springboard Publisher II	89
Clip 3D Business	57	SuperMac Software	
Clip 3D Fonts	57	Pixel Paint v2.0	225
Clip 3D Geography	57	Pixel Paint Professional	395
Clip 3D Lifestyle	57	Synergy KaleidaGraph	139
Clip 3D Messages	57	Tactic Software Art Clip vol 2	69
Clip 3D People	57	Art Clip or ArtFonts 1, 2 or 3	49
Clip 3D Recreation	57	TMaker Christian Images	39
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Comic Strip Factory	38	EPS Business Art	85
Generic Software Generic CADD	84	Zedcor DeskPaint 2.0	65



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PROGRAMS PLUS



45 MB Removable HDD by Cutting Edge

The Cutting Edge 45 MB Removable Cartridge Disk Drive offers the convenience of removable media with the reliability of Winchester technology. The new drive features the popular Syquest mechanism and includes one cartridge. **\$899.**

EDUCATIONAL/CREATIVE SOFTWARE

A Lasting Impression	Number Maze	Special 26
ResumExpert	Crystal Paint	25
ResumExpert Cover Letters	Learning Company	
ResumExpert Sales & Marketing	Reader Rabbit	31
ResumExpert Management	Math Rabbit	31
Ars Nova Practica Musica 2.1	Nordic	
Bogas Productions	Body Works	28
Sound Effects	Clock Works	28
String Quartet, Country or Heavy Metal	Coin Works	28
Super Studio Session	TurboMath Facts	28
Bright Star Technology	Earth Works	28
Talking Tiles	Flash Works	28
Alphabet Blocks	Lemonade Stand	28
Broderbund Type!	Naval Battle	28
Sensei Geometry, Calculus or Physics	PreSchool Disk 1	28
Where in the World is Carmen	PreSchool Disk 2	28
San Diego?	Word Search	28
Where in Europe is Carmen San Diego?	PreSchool Pack	Special 49
Where in the USA is Carmen San Diego?	Pelican Software	
Jam Sessions	Dinosaur Days	24
Carina Software Voyager 1.0	Monsters & Make Believe	24



Two Page Monochrome Monitor by Cutting Edge

The Cutting Edge Monitor includes the interface card and matches just about all the features of other big screen display systems costing twice as much. It has a flicker-free refresh rate of 70 Hertz and a high resolution of 72 DPI. Comes with a 1 year warranty and 30 day money back guarantee. **\$935.**

EDUCATIONAL/CREATIVE SOFTWARE (CONTINUED)

Coda Mac Drums	Penton Overseas	
Perceive	VocabuLearn/ce Spanish, French,	
Finale	German or Italian (Level 1)	Special 30
Davidson & Associates	VocabuLearn/ce Spanish, French,	
Speed Reader II	German or Italian (Level 2)	30
Math Blaster or Word Attack!	VocabuLearn/ce Japanese	
Electronic Arts	(Level 1 or 2)	Special 36
Mavis Beacon Typing	Primera Software	
Deluxe Music Construction Set V2.5	Different Drummer	55
Deluxe Recorder	Simon & Schuster	
First Byte	Typing Tutor IV	30
Dinosaur Discovery Kit	Springboard Top Honors	59
Puzzle Storybook or Rhyming Notebook	Family Matters	28
Great Wave Software	Atlas Explorer	28
KidsTime	Tactic Software	
Kids Math	SoundClips 1 or 2	49

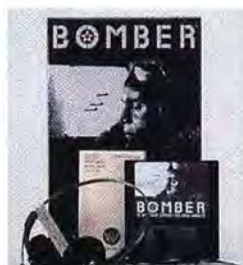


Hard Disk Drives by Cutting Edge

The hard drives range in capacity from 20 to 180 Megs. They are fast (aver. access time 20-28 ms.), and each has quality and dependability built in as evidenced by an average 70,000 hrs MTBF. The streamlined design fits comfortably under the Mac.

ACCESSORIES

Advanced Gravis	System Saver Mac (Beige or Platinum)	63
MouseStick (Plus or ADB)	Space Saver Printer Stand	17
Altra Felix ADB	Super Base	34
Basic Needs Keyboard Flip	System Saver SE	52
HardTop Kybd Cover	Masterpiece Mac II	105
HardTop Image II Cover	New Turbo Mouse (Reg. or ADB)	109
Laser Printer Stand	Universal Copy Stand	22
Large Screen Monitor Stand	Universal Printer Stand	14
CH Products Roller Mouse ADB	Apple Color Monitor or Full Page	
Cutting Edge	Display Polarizing Filter	63
Cutting Edge MCK-105QK KB	Two Page Display Polarizing Filter	135
w/Quickkeys	Power Back 330	269
DataDesk Hyper Dialer	Power Backer 450	339
MAC-101 Keyboard/Beige	Power Backer 520	399
(128K/512K & MacPlus)	Key Tronic	
MAC-101 ADB Keyboard/Platinum	Mac Pro Keyboard	
(Mac SE & Mac II)	w/Tempo II	Special 119
Foreign Keyboards Available	Lynx Computer	
Ergotron Mousecleaner 360°	Turbo Trackball (Mac & Mac+ or	
MacTilt (Mac, SE or II)	Mac SE & Mac II)	59
Muzzle SE	MicroSeeds WristMac	145
Muzzle Mac II	WristMac Executive	189



Bomber by Inline Design

Bomber is an intensely realistic action-adventure recreating the sights, sounds and split second decisions of young B-17 crews in the sky's over Nazi Germany. Digitized sound, animation and a 10 man crew. HyperCard required. Mac Plus-Mac IIci. **\$25.**

ACCESSORIES (CONTINUED)

Farallon MacRecorder Sound System	Mobius Fanny Mac QT	
(Mac SE or Mac II)	(Beige or Platinum)	59
GDT Software Print-Link Collection	Mouse Systems	
JetLink Express	A+ Mouse (MacPlus)	63
Goldstein & Blair	A+ ADB Mouse (Mac SE/Mac II)	83
Macintosh Bible 2nd ed.	Moustrak MousePad 7" x 9" Size	7
I/O Design	MousePad 9" x 11" Size	8
Mac Luggage in Navy, Black or Plat.	Moustrak Pad L/F 9" x 11"	9
Mac Plus Carrying Case	Orange Micro Grappler Spooler	38
Mac SE Carrying Case	Alphabits	69
MacIIcx Carrying Case	Grappler L/S	102
Mac II Carrying Case	Grappler L/X	129
Imagell Carrying Case	Practical Solutions Cordless Mouse	109



Micro TV by Aapps Corp.

Aapps **Micro TV** is a Nubus card that displays real time TV and other video sources in a window on a Macintosh II series in 128 gray scale. **\$275.**

ACCESSORIES (CONTINUED)

Kalmar Designs	Ribbons	
Teakwood Roll-Top Disk Cases:	Available in Black, Blue, Brown, Green,	
Micro Cabinet (holds 45 disks)	Orange, Purple, Red, Yellow, Silver & Gold	
Double Micro Cabinet (holds 90 disks)	ImageWriter Ribbon	4
Triple Micro Cabinet (holds 135 disks)	ImageWriter Black 6-pack	20
Kensington Mouseway (Mousepad)	ImageWriter Rainbow Pack	
ImageWriter or ImageWriter II Cover	(6 Colors)	20
Macintosh Plus/SE Dust Cover	ImageWriter II-Four Color Ribbon	9
Apple Security Kit	ImageWriter LQ Black	17
Antiglare Polarizing Filter	ImageWriter LQ Four Color	20
Mac II Stand and Cable Kit	Seikosha Ribbon Black	6
Mac II Monitor Stand	Sopris	
Power Tree Surge Suppressors	High Trek Imagewriter II Carry Case	49
(10, 20, or 50)	High Trek Mac Plus Carry Case	59
Model Fax Protector 10	High Trek Mac SE & ext kybd Carry Case	69
Modem Fax Protector 20	Targus Imagewriter II Carry Case Blk	43
Printer Muffler Stand (80 & 132)	Macintosh Plus Carry Case Blk	53
Printer Muffler 80	Deluxe MacPlus-XKB Blk	69

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MacConcept 3.0 by Klex Software

The 3D conceptual design system, sophisticated enough for engineers to illustrate complex wireframes, yet simple enough for artists to manipulate them into masterpieces. It provides multi-dimensional spacial design features that match those found in industry's most sophisticated design systems. Those include real-time dynamic rotation and perspective, multiple design levels, animation and floating point accuracy... \$999.



FileGuard Extended Ed. & FileGuard 1.04 by A.S.D.

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Complete PC	
Complete Hand Scanner 400	165.
Complete Hand Scanner OCR	189.
Complete Half Page Scanner	195.
Complete Full Page Scanner	585.
Cutting Edge	
Two-Page Display	
Monochrome Monitor	Special 935.
Digital Vision	
Computer Eyes Mac	195.
Computer Eyes Mac II	349.
GCC Technologies	
WriteMove Printer	555.
Personal Laser Printer	1755.

Koala Technologies Corp.	
MacVision 2.0 (Digitizer)	219.
Mac Director	109.
Kurta IS ADB Tablet 8 1/2 x 11	245.
IS ADB Tablet 12 x 12	385.
IS ADB Tablet 12 x 17	625.
Cordless 4 Button Cursor	65.
LogiTech	
ScanMan	345.
Seikosha	
SP1000 (Imagewriter comp.)	229.
Summagraphics	
Bit Pad Plus	319.
ThunderWare ThunderScan	185.
LightningScan	369.
Mac II Power Accessory	42.

UTILITY SOFTWARE

Adobe ATM (Adobe Typeface Manager)	57.
ATM+ (Adobe Typeface Manager Plus Pak)	113.
Abbott Systems, Inc. CanOpener	65.
ALSoft Master Juggler	64.
MultiDisk	49.
Disk Express II	64.
Font/DA Juggler Plus	42.
A.S.D. TWINS	69.
FileGuard v1.04	Special 95.
FileGuard II	Special 129.
Berkeley System Design Alter Dark	25.
Stepping Out II	50.
Beyond Inc. Menu Fonts 2	28.
Borland Sidekick 2.0	68.
Bravo SPAMM	49.
Central Point Software	
Copy II Mac (Includes MacTools)	22.
CE Software	
QuickKeys (Macro Program)	65.
MockPackage Plus Utilities	32.
Dantz Software Development	
Retrospect	149.
Dayna Communications	
DosMounter	55.
Dubl-Click	
Calculator Construction Set v2.0	45.
Farallon Computing	
Screen Recorder	125.
Fifth Generation Systems	
Suitcase II	44.
DiskLock	107.
FastBack II	107.
Power Station	34.
Pyrol	14.
HJC Virex	55.
Icom Simulations On Cue	35.
Ideaform MacLabeler Plus	42.
Insight Development MacPrint	79.

Kent Marsh QuickLock	57.
MacSafe or KnightWatch	87.
Loop Software PictureBook	40.
Lundeen & Assoc.	
WorksPlus Command	85.
Magic Software Auto Save II	28.
POWERCONS	39.
POWERmenus	39.
Back-Matic	50.
MainStay	
AntiToxin or ClickPaste	55.
Microlytics, Inc.	
GOfer v2.0	46.
Microseeds INITPicker	27.
Redux	51.
ScreenGems	39.
Olduvai Software MultiClip	50.
Read-It! O.C.R. Personal	97.
Read-It! O.C.R. 2.1	239.
PCPC HFS Back-Up 3.0	54.
Peripheral Land TurboOptimizer	39.
TurboBack	51.
TurboCache	69.
TurboSpool	69.
SuperMac Software	
SuperSpool 5.0	Special 58.
SuperLaserSpool 2.0	Special 88.
DiskIt 1.5	58.
Sentinel 2.2	88.
Symantec	
Symantec Utilities for Mac (SUM II)	95.
Symantec AntiVirus for Mac (S.A.M.)	63.
TENpoint OpenIT!	49.
Williams & Macias DiskFinder	25.
myDiskLabeler w/Color	28.
myDiskLabeler	
w/LaserWriter Option	33.
StickyBusiness	89.
XTree Company XTree	52.



Super/SuperLaserSpool by SuperMac Software

SuperSpool (\$58) and **SuperLaserSpool (\$88)** take control of printing in the background and return the Mac to your control in seconds. These best-selling print spoolers are the fastest available and include a special desk accessory that lets you delete documents from queue, re-order them, reroute documents to other printers (SLS) and preview or zoom in on documents.

SPELLING & GRAMMAR CHECKERS

Deneba Software	
Big Thesaurus	59.
Spelling Coach 3.0 Professional	115.
Electronic Arts	
Thunder! II	52.
Lundeen & Associates	
WorksPlus Spell	55.

Microlytics, Inc.	
Word Finder (Synonym Finder)	35.
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DataStor Personal Organizer	95.
Sensible Software	
Sensible Grammar or BookEnds	53.
Working Software	
Spellswell 2.0	45.



Gravis MouseStick by Advanced Gravis

Gravis and Data East have joined together to create a sensational challenge by including Super Hang On with every **Gravis MouseStick**. The **MouseStick** offers incredible precision, versatility, and durability. As one **MouseStick** user states, "A definite must for the Mac user! Increases productivity in DTP and graphics, as well as making games much more fun." Available in ADB, Plus and Apple IIGS versions. \$69.



Insight Expert Accounting Series by Layered Inc.

Insight Expert Accounting Series, the #1 award winning accounting package for the Macintosh, consists of 6 stand alone or fully integrated modules. Now includes IMPORT capabilities. SAVE \$\$\$ NOW on 3-Pak Holiday Special. \$395.



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PROGRAMS PLUS



Rags to Riches 3-Pack by Chang Labs

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BUSINESS SOFTWARE

Abacus Concepts StatView II (Mac+, SE, II w/68020 & 68881)	279.
StatView SE+ Graphics	199.
A.E.C.	
FastTrack Schedule	114.
AEC Information Manager	405.
Antic Software	
Flexforms Business Template 1	49.
Flexforms Business Template 2	49.
Ashton Tate	
Full Impact	249.

Palo Alto Software	
Business Plan Toolkit	75.
Paracomp	
Milo	155.
Portfolio Systems	
Dynodex	Special 89.
Power Up Calendar Creator	38.
Address Book Plus (Book Binder)	85.
Fast Forms	89.
Preferred Publishers	
Direct Mail	54.



Dialoger by theResult Software

Dialoger lets you design, create and control dialog windows entirely within HyperCard. Perfect for both novice and expert users. Break through HyperCard's limits with color, lists, pop-ups and total interactive control. **\$69.**

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MacCalc	79.
Claris MacProject II	365.
Smartform Designer	285.
Individual 101 Macros For Excel	35.
Mainstay Capture	45.
Mac Flow 3.0	125.
Mac Schedule	109.
Micro Planning International	
Micro Planner 6.1	Special 325.
Microsoft Microsoft Works 2.0	185.
Microsoft Excel 2.2	249.
Micro Trading Software	
Stock Watcher	185.
Nolo Press WillMaker 3.0	32.
For the Record	28.

Pro Plus WallStreet Investor v3.0	395.
Satori Software Bulk Mailer 3.3	78.
Bulk Mailer Plus	185.
Select Micro Systems, Inc.	
Exstatix	209.
MapMaker v4.0	239.
SoftStream Endeavour Planner	99.
SoftView MacInUse	42.
Form Set Business Forms	52.
Symmetry KeyPlan	279.
Synex Mac PhoneBook	45.
Mac Envelope 4.1	55.
Mac EnvelopePlus	147.
Systat Systat 4.0	
(Specify MacPlus, SE or Mac II)	459.
Fastat	165.

DataLink Express Modem by Applied Engineering

Introducing **DataLink Express**, the first fully Hayes compatible 2400 baud modem designed specifically for the Mac. With the first comprehensive status light array, "Line Engage" indicator and upgradeable design (add send-Fax capability and MNP error correction). Comes complete with a perfectly matched Mac-platinum case, a Macintosh-type serial port input, a DB-25 connector and communications software. **\$189.**



ENTERTAINMENT SOFTWARE

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World Class Leader Board Golf	27.
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4th & Inches	27.
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Grand Prix Circuit	30.
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Manhole CD ROM	35.
Cosmic Osmo	42.
Artworx GrailQuest or Daily Double Horse Racing	19.
Bridge 6.0	24.
Bethesda Softworks	
Wayne Gretzky Hockey	39.
Broderbund	
Ancient Art of War or At Sea	26.
ShufflePuck Cafe or Star Wars	24.
SimCity	29.
SimCity Supreme Pack	48.
Bull City Software Moriarty's Revenge	32.
Bullseye Software	
Fokker Triplane Flight Simulator	24.
P51 Mustang or Ferrari Grand Prix	32.
MicroProse Pirates	34.
Microsoft Flight Simulator 1.02	32.
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Captain Blood, Hostage or Gauntlet	29.
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MacCourses	20.
Road Racer	39.
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NFL Challenge	53.
Premier Technology Net Trek	35.
Strategic Conquest Plus 2.0	35.



ScriptEdit by Somak Software

ScriptEdit is a powerful desk accessory for HyperCard. Edit multiple scripts simultaneously, global search-and-replace, custom editing with XCMD, script compare feature and much more! Includes installation stack with tips. **\$51.**

ENTERTAINMENT SOFTWARE (CONTINUED)

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Casady & Greene, Inc. Crystal Quest	25.
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Centron Casino Master	45.
Casino Master (Mac II)	50.
Data East Super Hang On	27.
DataSoft Time & Magic	29.
Hunt for Red October	32.
Discovery Software Arkanoid	26.
Electronic Arts Bards Tale	32.
Chuck Yeager Flight Simulator	32.
Starfleet I	36.
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Primera Smash Hit Racquetball II	18.
Shodan Leprechaun	Special 35.
Sierra On-Line	
Space Quest or Space Quest II	29.
Leisure Suit Larry, Silpheed or Gold Rush	23.
Police Quest or ManHunter	29.
King's Quest I, II or III	29.
Silicon Beach Software	
Airborne or Enchanted Scepters	15.
Dark Castle or Apache Strike	32.
Beyond Dark Castle	32.
Sir-Tech Mac Wizardry	35.
SoftStream, Inc. Colour Billiards	35.
Mac Man or Solitaire DA	23.

Blueprint by Graphsoft

Blueprint is a professional-level 2D CAD program that has it all at a price you can afford: Layers, fillets, DXF, constraint palette, auto-dimensioning, high precision, hatching, EPS, symbol library plus more. Unsurpassed quality. **\$295.**



ENTERTAINMENT SOFTWARE (CONTINUED)

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Infocom	
Leather Goddesses of Phobos	15.
Beyond Zork or Hitchhiker's Guide	15.
Zork Trilogy	20.
QuarterStaff	29.
Arthur or Journey	29.
Zork Zero	35.
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MicroLeague Sports	
MicroLeague Baseball II	39.
Software Toolworks Life & Death	32.
Chessmaster 2100	32.
Sphere, Inc. Tetris	19.
Tetris (Mac II)	24.
GATO, Orbiter or Pt-109	26.
Vette!	26.
Solitaire Royale (SE or II)	19.
Falcon 2.0	31.
Springboard Hidden Agenda	36.
SubLogic Jet	32.
Toyogo, Inc. Go Master	Special 49.
Joseki Tutor	Special 30.



Tempo II by Affinity Microsystems

Tempo II can take a series of keystrokes or mouse clicks and turn them into a one key code. Whether your macro just selects a font or performs hundreds of steps through multiple programs, **Tempo II** replays it all with a single keystroke. And as your needs grow, **Tempo II** meets them. Transfer directly between applications, auto-paste text and graphics, repeat your commands 100's of times. Great for automating data transfers! **\$75.**

ACCOUNTING PACKAGES

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Aatrix TimeMinder.....	149.	Quicken v1.5	36.
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Aatrix TimeCard	69.	AtOnce!.....	Special 285.
Aatrix Payroll v3.5	95.	Insight Expert INV or	
Brown-Wagn		Time Billing	Special 395.
MacLedgers	155.	Insight Expert GL, AR, AP	
Service Industry Accounting	205.	or Payroll	Special 395.
Chang Labs Rags to Riches		MECA	
Professional 3 pack	355.	Managing Your Money	124.
Rags to Riches Retail		Money Magazine	
Business 3 pack	355.	WealthBuilder	Special 149.



MacKids Preschool Pack by Nordic Software

MacKids Preschool Pack (\$49), includes six educational lessons in color. It teaches your child the ABC's, shapes, counting and more in a fun and exciting manner. Ten additional **MacKids** programs are available in black & white format.

ACCOUNTING PACKAGES (CONTINUED)

Rags to Riches 3-Pak 3.1 (GLI/AR/AP).....	Special 285.	Monogram Business Sense	269.
Rags to Riches Inventory Control.....	235.	Dollars & Sense 4.1c.....	81.
Rags to Riches Professional Billing.....	235.	Niles & Associates	
Rags to Riches GL, AR, or AP	118.	Grant Manager	249.
Check Mark		North Edge Software	
MultiLedger	239.	Timeslips III.....	169.
Payroll	179.	Peachtree	
Cash Ledger	119.	Back To Basics Professional	
Computer Associates		(GLI/AR/AP/INV)	155.
Simply Accounting	219.	ProPlus Software	
Dac Software		ProPlus Accounting	619.
Dac-Easy Light	42.	Satori Software	
Dow Jones		Components GL	369.
Market Manager PLUS.....	189.	Survivor Software	
		MacMoney 3.0 (Enhanced Ver.)	59.



Nisus by Paragon Concepts

With **Nisus**, word processing comes of age. Only **Nisus** has unlimited undos, graphics within text, recordable macros, Easy Grep, effortless indexing, footnotes/endnotes, hyphenation, 10 clipboards, automatic repagination, on-screen/printing line numbers, intelligent spell checking, plus all the search and replace power of QUED /M. And it's not just for super-users — **Nisus** needs only a Mac Plus or larger. **\$245.**



atOnce! by Layered Inc.

atOnce! is the next generation in high-speed small business accounting. Included in one seamlessly integrated module are four full featured applications: General Ledger, Accounts Receivable w/Billing, Accounts Payable & Payroll. **\$285.**

COMMUNICATION SOFTWARE

Compuserve Compuserve Starter Kit	24.	Prometheus MacKNOWLEDGE	139.
Compuserve Navigator	39.	Meta Comet	
DataViz MacLink Plus/Translator	99.	Accu-Weather Forecaster.....	57.
MacLink Plus with Cable	119.	Software Ventures	
Freesoft White Knight v.11	85.	Microphone II v3.0	215.
Hayes Smartcom II 3.1	87.	Solutions, International BackFax	124.
Infosphere		Synergy Software VersaTerm	88.
Liaison	Special 169.	VersaTerm-Pro	174.
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- 7) Winners responsible for taxes. 8) Programs Plus will announce winner on or about February 5, 1990. 9) Winners notified by mail. 10) If unable to contact winner, an alternate will be selected by random drawing. 11) Contest is open to U.S. residents except where prohibited by law.
- 12) Employees of Programs Plus and suppliers are not eligible.

HyperDA 1.2 by Symmetry

This desk accessory allows you to access HyperCard stacks anytime, on any Mac from the 512K and up. Browse, search, phone dial, copy text and graphics and even print stacks. New version 1.2 allows you to add or modify text in existing text fields. **\$49.**



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Page-Layout Play-offs

By Robert Virkus

Choosing just one page-layout program to handle your four-color publication is a difficult mission. If your publication is graphics-oriented, you may think all you need is a layout program that handles graphics with relative ease. If it's text-intensive, then you may assume that typographic capabilities are of prime importance.

But when you're working with editorial, copyediting, art, and production departments to produce a four-color publication, graphics and typography are only two of the many issues you must consider. Page-layout programs have some tall orders to fill.

In this article, I'll walk you through the stages of the production process, using roughly the same order that many publications use. Layout programs must hook up seamlessly with

word processors; let designers apply their own layout styles through master pages; place text and graphics; and handle hyphenation, justification, and font scaling. They must also let users place color, copyedit on the page, separate color elements, and crop graphic elements. But that's not all—these programs must also interface with high-end output devices.

Looking at how all layout programs handle these tasks would be impossible—some of the more recent entrants to the market don't yet have all the capabilities for producing a four-color publication. (For a look at the newer entrants in the page-layout race, see the "Sideline Contenders" sidebar). Instead, I'll describe how each of the three most popular programs—QuarkXPress 2.12, PageMaker 3.02 with Color Extension,



PHOTOGRAPHY: MEL LINDSTROM



The Big Three page-layout programs battle it out to prove which is best at producing a four-color publication.

and Ready,Set,Go! 4.5a — stand up to the task of producing a four-color publication. At each stage in the process, I'll tag the program that's the leader in performing that task. Finally, I hope to help you make an informed buying decision based on your particular needs.

Word-Processing Hooks

Once a manuscript has left an editor's desk, it should be formatted (that is, margins, fonts, and type sizes should be applied) according to the publication's style. Many word processors let you apply these attributes through style sheets. Some large publications receive their manuscripts via modem as text files, and format information in this text is coded, with angle brackets surrounding each style call, resulting in so-called tagged text.

I looked at how MacWrite II, Word 3 and 4, WriteNow 2, and Nisus 2.02 worked with the layout programs.

The job of the page-layout program at this stage is to accept all this styling information from the imported manuscript, and it should do so seamlessly. QuarkXPress recently incorporated Word 4 and MacWrite II filters, so it now reads these files directly, along with Word 3 and WriteNow files. About the only style shortcoming of QuarkXPress is that it doesn't distinguish between native and imported style sheets. Knowing that a style sheet is imported can be useful in determining the cause of a problem if you have a troublesome document.

Nisus presents a problem for QuarkXPress and the other programs because, when you save a file, it

stores its styling information in the resource fork. This means that the page-layout programs must bring Nisus files over as tagged text, without any styling attributes.

QuarkXPress reads and writes ASCII text with character formatting and style-sheet names. Character formatting includes kerning, bold-face, italic, font, and line-break information. It also has information concerning point size, em space, figure space, nonbreaking space, discretionary hyphen, and even color.

PageMaker was the first layout program to read Word 4 files directly, and it's still the only layout program to distinguish between native and imported style sheets. PageMaker accepts styles from WriteNow files the same way QuarkXPress does, but it can't import MacWrite II files

ALEX	ITC ALEX TM	Kaman	BOLD WIGMAN
AA	ITC AA TM	Bookman	BOLD WIGMAN
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ALBERTUS	TITLING	BRASS PLATE[™] (ICI)	
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Aquarius 2		ITC CASLON[™]	
Aquarius 6		Caslon	NO. 224 BOOK
Aquarius 10		Caslon	NO. 224 BOOK F
Aquarius	OUTLINE	Caslon	NO. 224 BOLD
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Arquitectura		Caslon	CASTLE (CI)
ARROW[™] (VDC)		Castle	
Arrow		Castle	GREY
AUGUSTEA		ITC CENTURY[™]	
AUGUSTEA		Century	BOOK
AUGUSTEA	ITALINE	Century	BOOK ITALIC
ITC AVANT GARDE GOTHIC[™]		Century	BOLD
Avant Garde	GOthic LIGHT	Century	BOLD ITALIC
Avant Garde	GOthic LIGHT GRN	Century	BOLD ITALIC
Avant Garde	GOthic BOOK		
Avant Garde	GOthic GRN BOOK		



Club Typeface

LEAGUE BOLD

Jamill BOLD

Kabel MEDIUM

Ka BOLD

Kaufman Script

Korinna BOLD

Korinna KURSIV BOLD

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Lubalin GRAPH MEDIUM OBLIQUE

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Lubalin GRAPH DEMI OBLIQUE

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Nevelion CASUAL SCRIPT

ITC™ NEW BASKERVILLE®

New Baskerville

New Baskerville

New Baskerville

New Baskerville

NEW YORKER (ICI)

New Yorker

New Yorker ENGRAVED

NEWS GOTHIC (ATF)

News Gothic

News Gothic

ITC™ NEWTEXT™

Newtext

Newtext REGULAR

Newtext ITALIC

Novarese BOLD

Novarese BOLD ITALIC

OLIVE ANTIQUE

Olive ANTIQUE

Olive ANTIQUE ITALIC

Olive ANTIQUE BOLD

olive ANTIQUE BLACK

Olive ANTIQUE NARROW

olive ANTIQUE BLACK EXT.

olive ANTIQUE BLACK EXT. ITALIC

OMNI (ICI)

Omni

Omni ITALIC

Omni BOLD

Omni BOLD ITALIC

Omni BLACK

ORGANDA™ (FVG)

ORGANDA

ORGANDA BOLD

P2 BASKIN (ATF)

P. T. Barrum

ITC™ PACELLA®

Pacella BOOK

Pacella BOOK ITALIC

Pacella BOLD

Pacella BOLD ITALIC

PAINTBRUSH™ (ICI)

PAINTBRUSH

PAINTBRUSH <small>DRY</small>	ITC STAMBOLO
PACIFICA CONDENSED <small>THICK</small>	Symbol <small>BOOK</small>
PACIFICA <small>COND.</small>	Symbol <small>BOOK ITALIC</small>
SIGNAL TYPE <small>DRY</small>	Symbol <small>BOLD</small>
<i>Signature</i>	Symbol <small>BOLD ITALIC</small>
<i>Signature Light</i>	ULTRA CONDENSED <small>THICK</small>
ITC SLIMBLACK <small>TM</small>	Ultra Condensed Sans
Slimbach <small>BOOK</small>	Ultra Condensed Serif
Slimbach <small>BOOK ITALIC</small>	UNIFORM <small>DRY</small>
Slimbach <small>BOLD</small>	Uniform 45
Slimbach <small>BOLD ITALIC</small>	Uniform 46
SOL <small>TM</small> FWG	Uniform 55
Sol <small>thin</small>	Uniform 56
Sol <small>heavy</small>	Uniform 65
ITC SOUVENIR <small>DRY</small>	Uniform 66
Souvenir	Uniform 75
Souvenir <small>ITALIC</small>	Uniform 76
Souvenir <small>DEMI</small>	ITC UPRIGHT <small>DRY</small>
Souvenir <small>DEMI ITALIC</small>	Upright Regular
STAMP <small>TM</small> DRY	ITC USHERWOOD <small>DRY</small>
STAMP	Usherwood <small>BOOK</small>
STAMP <small>GREY</small>	Usherwood <small>BOOK ITALIC</small>
STEELPLATE GOTHIC <small>(ATF)</small>	Usherwood <small>BOLD</small>
STEELPLATE	Usherwood <small>BOLD ITALIC</small>
STENCIL <small>(ATF)</small>	ITC VELVOTIC <small>DRY</small>
STENCIL	Veljovic <small>BOOK</small>
STERLING <small>DRY</small>	Veljovic <small>BOOK ITALIC</small>
<i>Sterling</i>	Veljovic <small>BOLD</small>
ITC STONE INFORMATION	Veljovic <small>BOLD ITALIC</small>
Stone Inf. <small>MEDIUM</small>	VIVALDI <small>FWG</small>
Stone Inf. <small>MEDIUM ITALIC</small>	<i>Vivaldi</i>
Stone Inf. <small>SEMI BOLD</small>	ITC WEIDEMANN
Stone Inf. <small>SEMI BOLD ITALIC</small>	Weidemann <small>BOOK</small>
Stone Inf. <small>BOLD</small>	Weidemann <small>BOOK ITALIC</small>
Stone Inf. <small>BOLD ITALIC</small>	Weidemann <small>BOLD</small>
ITC STONE SANS <small>TM</small>	Weidemann <small>BOLD ITALIC</small>
Stone Sans <small>MEDIUM</small>	ITC ZAPF BOOK <small>DRY</small>
Stone Sans <small>MEDIUM ITALIC</small>	Zapf <small>LIGHT</small>
Stone Sans <small>SEMI BOLD</small>	Zapf <small>LIGHT ITALIC</small>
Stone Sans <small>SEMI BOLD ITALIC</small>	Zapf <small>MEDIUM</small>
Stone Sans <small>BOLD</small>	Zapf <small>MEDIUM ITALIC</small>
Stone Sans <small>BOLD ITALIC</small>	Zapf <small>DEMI</small>
ITC STONE SERIF <small>TM</small>	Zapf <small>SEMI ITALIC</small>
Stone Serif <small>MEDIUM</small>	Zapf <small>heavy</small>
Stone Serif <small>MEDIUM ITALIC</small>	Zapf <small>heavy ITALIC</small>
Stone Serif <small>SEMI BOLD</small>	ITC ZAPF CHANCERY <small>TM</small>
Stone Serif <small>SEMI BOLD ITALIC</small>	Zapf <small>CHANCERY MEDIUM</small>
Stone Serif <small>BOLD</small>	Zapf <small>CHANCERY ALE</small>
Stone Serif <small>BOLD ITALIC</small>	Zapf <small>CHANCERY MEDIUM ITALIC</small>
ITC STYLISH HAIRLINE <small>DRY</small>	Zapf <small>WURGULAR ALT</small>
<i>I & C Stylish</i> <small>HAIRLINE</small>	ITC ZAPF INTERNATIONAL <small>DRY</small>
SURF STYLE <small>DRY</small>	Zapf Int'l <small>LIGHT</small>
<i>Surf Style</i>	Zapf Int'l <small>LIGHT ITALIC</small>
Surf Style <small>BOLD</small>	Zapf Int'l <small>MEDIUM</small>
	Zapf Int'l <small>MEDIUM ITALIC</small>
	Zapf Int'l <small>DEMI</small>
	Zapf Int'l <small>DEMI ITALIC</small>

600 Typefaces

They just won't fit onto one page. This is the Image Club PostScript typeface library. 600 licensed "brand name" typefaces compatible with your Mac or PC and any PostScript printer. The typefaces are available on floppy diskettes in separate families as illustrated here or the entire library of 600 faces on our new Letterpress CD ROM (available for the Mac only).

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Please note that typeface families cannot be split up.

Discount schedule:

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Page-Layout Play-offs

directly. You must save MacWrite II files as WriteNow or Word 3 files before importing them.

Reading tagged text as style-name tags that format individual paragraphs, PageMaker implements its own definition of the style in each style-name tag. Paragraphs that are not preceded by a style-name tag are formatted in the style of the preceding paragraph. If a tag doesn't match an existing style, PageMaker creates a new style based on the imported attributes.

Ready,Set,Go! handles tagged text files the same way PageMaker does. It reads WriteNow and Word 3 files directly but has no filters for Word 4 or MacWrite II. Ready,Set,Go! keeps Word 3 attributes, but it can't create new style sheets. If, however, you create a new style while your cursor is still in an imported text block,

Ready,Set,Go! will open the dialog box for the document with those attributes as the default settings.

With its Word 4 and MacWrite II filters, QuarkXPress is the leader in this category, though PageMaker comes in a close second because it distinguishes between native and imported style sheets.

Applying the Page Style

Page-layout programs have their own style sheets — boxes of preformatted text that can save you some time in page arrangement. These style sheets include basic font information, the track or pair kerning for a particular point size, and the width and depth of text elements such as headlines.

QuarkXPress and Ready,Set,Go! let you copy and paste preformatted text boxes between publications.

PageMaker also supports style sheets. In all three cases, all style-sheet characteristics are carried forward.

Mastering the Pages

Master pages provide an overall style in page-layout programs, often including elements that are the same for several pages, such as layout grids.

QuarkXPress has what's called a default page that acts as the master page, letting you specify the basic layout for a publication. All pages in a publication start with the default page's layout format. Should you change this default page, all pages you create subsequently will take on the new attributes but these changes won't affect the previous pages. QuarkXPress also lets you choose text attributes from the Style menu and apply them to the active text box (style sheet) or to any other text boxes

Glossary



Color separation is the process that converts a design, publication, or image to four sheets of negative film. The film exposes plates that, when run on a press, combine the four separate inks of cyan, magenta, yellow, and black (CMYK)

to re-create the image on paper.

Leading, for typographers, is the vertical spacing between the baselines of two lines of text. Some word-processing programs and PageMaker define it as the vertical spacing between the tops of capital letters in two successive lines of text. This spacing is expressed in points (12-, 14-, or 24-point, for example).

Master pages contain the guides, column rules, running heads, and graphics that are common to every page in a publication. The name *master page* is specific to PageMaker and Ready,Set,Go!, but the concept is generalized for all layout programs. QuarkXPress, for example, calls the master pages default pages.

Pair kerning is when you adjust the spacing between two adjacent characters in a line of text. It usually moves them closer together.



Posterization is the process of averaging groups of grays, which removes gradations and, in their place, creates steps. The result is pure white with pure black and about five gray steps in between. You can assign colors to each of these grays for color posterization. This process raises the contrast level of a gray-scale image.



Solarization is the reversal or partial reversal of tones in a gray-scale image (caused by overexposure, in the case of black-and-white photographs). You reverse the tones by adding grays to whites in the image. This process lowers the contrast of a gray-scale image.

Stripping is assembling individual four-color film separations of each page element, such as a page of text, graphics, and photographs, into one final set of four-color film.

Style sheets in word-processing programs contain information for fonts, sizes, margins, and justification. In page-layout programs, style sheets consist of boxes of preformatted text containing information on fonts, track and pair kerning for a particular point size, and the width and depth of text elements such as drop caps.

Tagged text is ASCII text with code containing styling information enclosed in angle brackets — for example, <head1>, <body>, <caption>. You type tags in your word-processing file wherever you want the style to change. When you place the text in the page-layout program, the tags disappear and the text is automatically formatted as it flows into place.



Track kerning, also called tracking, is the adjustment of white space either globally or between selected characters and words in a document relative to point size.

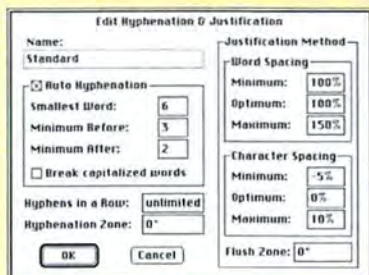


Vertical justification adjusts the spacing between lines of text, causing the text to fill in the space specified for a column. The result of this process is a page with text in all columns lined up across the top and bottom.

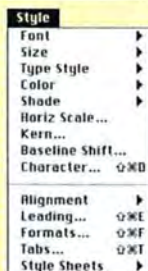
Typographic Functions

QuarkXPress

Figures 1a and 1b: QuarkXPress gives you complete typographic control over a document through such items as the Edit Hyphenation & Justification dialog box and the Style menu. You can, for instance, specify the amount of pair kerning and leading by entering a numerical value in the Kern and Leading dialog boxes. All hyphenation and justification controls can be included in QuarkXPress' style sheets.



1a

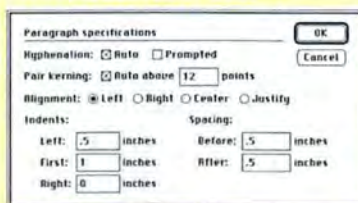


1b

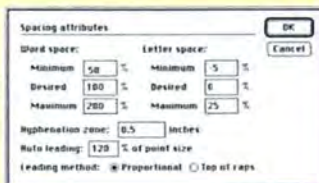
PageMaker

Figures 2a, 2b, and 2c: Most kerning for individual sections of a document in PageMaker must be handled by keystrokes — you can enter a kerning value for the whole document only. PageMaker also lacks a vertical-justification command; you must manually move the text until it looks vertically justified. PageMaker does have an automatic hyphenation function that first checks the user-definable supplementary dictionary and then checks the built-in dictionary.

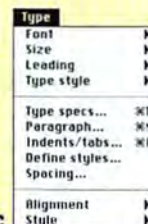
2a



2b



2c

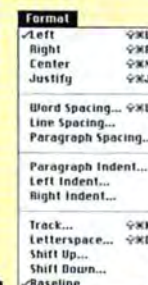


Ready,Set,Go!

Figures 3a and 3b: Ready,Set,Go! has more hyphenation controls than PageMaker does but not as many as QuarkXPress. After checking the user-defined dictionary, it relies on a hyphenation algorithm. Ready,Set,Go! also lets you specify a justification in which excess vertical space is evenly distributed among all lines.



3a



3b

on the default page. When you insert new pages, the text boxes will have the format of the default page's text boxes.

Every PageMaker publication has one or two blank master pages. Master pages include elements that repeat from page to page and are laid over the regular pages. Unlike QuarkXPress' default pages, PageMaker's master pages don't allow for intermittent changes within a document. If you change the master page in a PageMaker document, all pages will take on the new format. The only way around this is to selectively ignore the master page and either format the page manually or selectively cut and paste the master-page elements you want to keep on the new page.

Ready,Set,Go! has preconfigured default settings, which are independent of the master pages, that are automatically applied to every new document. You can change these settings, which include all the items in the Preference and Page Setup dialog boxes, the hyphenation specifications, the grid structure, and the default font. In addition, Ready,Set,Go! has master pages that you have to turn off if you want to deviate from the master format.

Choosing a leader in page styling is difficult because it depends on your preferences. If you're looking for precision in your layouts, you'll like all the controls that QuarkXPress offers. On the other hand, if you have more of an eye toward design and not so much for precision, you may prefer the WYSIWYG approach to page layout offered by PageMaker and Ready,Set,Go!. Of these two programs, PageMaker offers more freedom from the structure. But like Ready,Set,Go!, PageMaker has certain default settings that come with each new document.

Preliminary Page Layout

I'm going to divide page layout into two stages: one that happens before you place graphics on the page and a second that happens after this process. In the first stage, you pour



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Sideline Contenders

Nearly every comparison of page-layout programs features the Big Three: PageMaker (the reigning champ), QuarkXPress (the feisty challenger), and Ready,Set,Go! (the eternal bridesmaid). But contrary to popular belief, these aren't the only options. There are a half dozen other programs at the high and low ends of the publishing spectrum. This time next year, expect to see some new blood in the DTP face-offs.

The Program Most Likely to Succeed against the entrenched trio is Letraset's **DesignStudio** (\$795), a newly released program aimed at graphic-arts professionals (see DTP section, December '89). It uses an electronic pasteboard (as PageMaker does) in addition to text and graphics frames and offers several features many of its competitors lack: a choice of grids and guides for design work, a rotation tool for text and objects, editable thumbnails, object grouping, a "nudge" key for small movements, a polygon tool, vertical justification of text, a spelling checker, preferential hyphens, and search and replace of style sheets. Add-on modules called Annexes let third-party developers supply new capabilities such as editors for kerning pairs and tracking. DesignStudio handles 24-bit color and supports the Pantone Matching System for spot color. The Optronics division of Intergraph is providing the color-imaging software for full-page color separations that will be packaged as an Annex and sold separately. DesignStudio's output can be sent to a variety of printers and imagesetters, including Optronics' ColorSetter 2000 and the Crosfield prepress system. Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653; (201) 845-6100.

On the other hand, you may not need fancy typography, color separations, or the learning curves and price tags that come with them. **Springboard Publisher** supplies basic word-processing, graphics, and page-layout capabilities in one inexpensive (\$199.95), easy-to-use package (see DTP section, May '89). It provides such niceties as a typing window for text entry, a full set of painting tools, and independent page orientation within a document. Springboard Publisher II, just released, adds a spelling checker, limited gray-scale control (there's no color support), text wrap through graphics (for watermark effects), and six special text effects from Emerald City's Smart Art series. Springboard Software, 7808 Creekridge Circle, Minneapolis, MN 55435; (612) 944-3915.

A step up the ladder is Silicon Beach's **Personal Press**, scheduled to ship in early 1990. This \$299 package pushes ease of use via "proxies" — page previews that inhabit nearly all dialog boxes. The proxies provide instant feedback on how changes in text, graphics, or layout will look before you click on the OK button. The innovative AutoCreate dialog box lets you select a template and place all text and graphics for a multipage document before you actually open it. Personal Press can import 8-bit color graphics, although output is limited to spot color. It includes drawing tools and gray-scale editing features, and

its word processor has a thesaurus. The program's other innovations include the Workbook (a scrapbook for storing text and graphics), Posted Notes, and Link Navigator (which guides you through linked text blocks). Silicon Beach Software, 9770 Carroll Center Road, Suite J, San Diego, CA 92126; (619) 695-6956.

Publish It! is a midrange product in both price (\$395) and features (see StartUp, December '89). It's small (it runs on a 512KE) and fast and can open multiple documents. It has a word processor; paint and draw tools; a plethora of templates; and several high-end features — text rotation, vertical justification, patterned and toned text, and editable thumbnails. It imports color PICT2 images but no other color or gray-scale graphics. You can assign up to eight colors within the program and do spot-color separations. Unfortunately, Publish It! has some problems with graphics handling and printing that keep it from reaching its full potential. Timeworks, Inc., 444 Lake Cook Road, Deerfield, IL 60015; (312) 948-9200.

There are a few page-layout programs that cater to specialized segments of the DTP market. **Multi-Ad Creator** (\$995) is designed specifically for producing display ads, fliers, and other single-page layouts. It provides text and object rotation, numerous drawing tools, customized layout sizes, "design sheets" for storing formats, and a "suggest" feature that automatically generates alternative layouts. Multi-Ad Creator handles spot-color and four-color separations, and it can save files in PICT format so ads can be placed in other page-layout programs. It also comes with a CD-ROM containing more than 300 EPSF graphics and a year's worth of free tech support and product upgrades. Multi-Ad Services, 1720 Detweiler Drive, Peoria, IL 61615; (309) 692-1530.

RagTime, a \$595 European import, offers a unique method for handling spreadsheets, databases, and graphs. Version 3.0 performs all the usual layout chores (in color), plus it can import and edit data from Excel, Lotus 1-2-3, FileMaker, and 4th Dimension. RagTime's business orientation includes the ability to create fully integrated spreadsheets and graphs; its graphing tools generate a variety of chart types. It can do spelling checks and hyphenation in 14 languages, and it has built-in scanner drivers. RagTime's U.S. distributor is Migrant Software, 313 Iona St., Naberth, PA 19072; (215) 667-9781.

If you're producing books or technical documents, take a look at **Interleaf Publisher** (see DTP section, April '89). This \$995 program focuses on the entire document instead of the page. It sports automatic generation of indexes and tables of contents, anchored graphics, CAD-like drawing capabilities, and multiuser support. Interleaf was ported from the workstation world, and fully formatted files can be swapped among its various platforms. On the negative side, it has hefty system requirements, font-management problems, and no color support. Interleaf, 10 Canal Park, Cambridge, MA 02141; (617) 577-9800.

— Aileen Abernathy

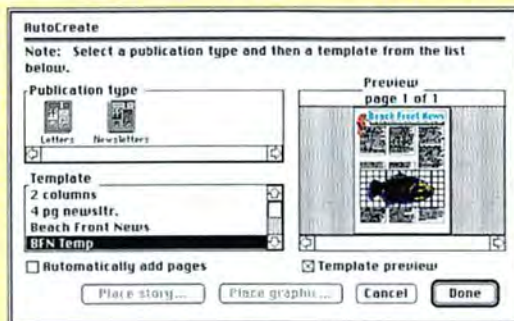
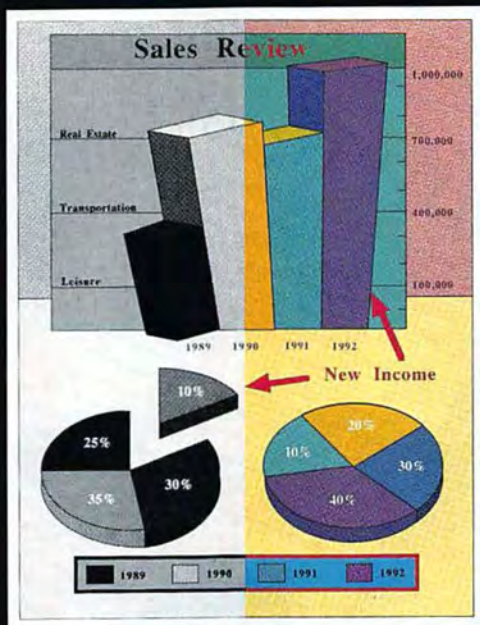


Figure A: Personal Press' innovations include the AutoCreate dialog box, which lets you select a template and place all the text and graphics for a multipage document before you actually open it. The elements are placed directly in the preview (at right), which provides constant feedback on the publication's content and appearance.

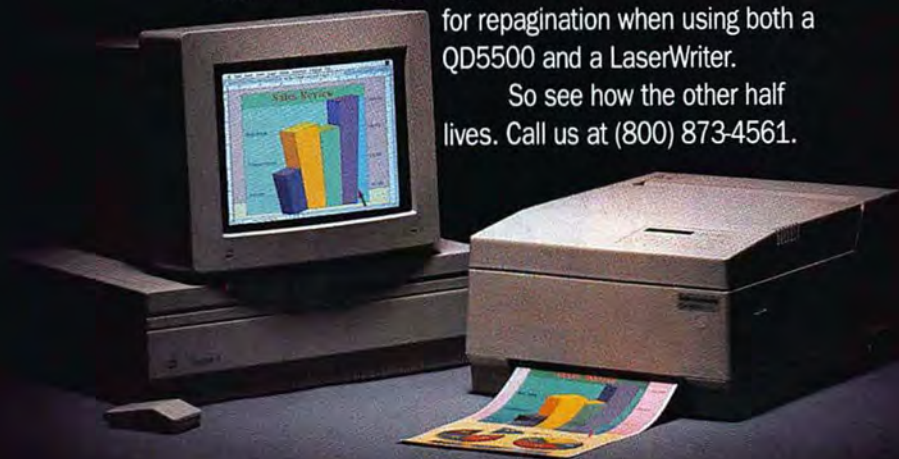
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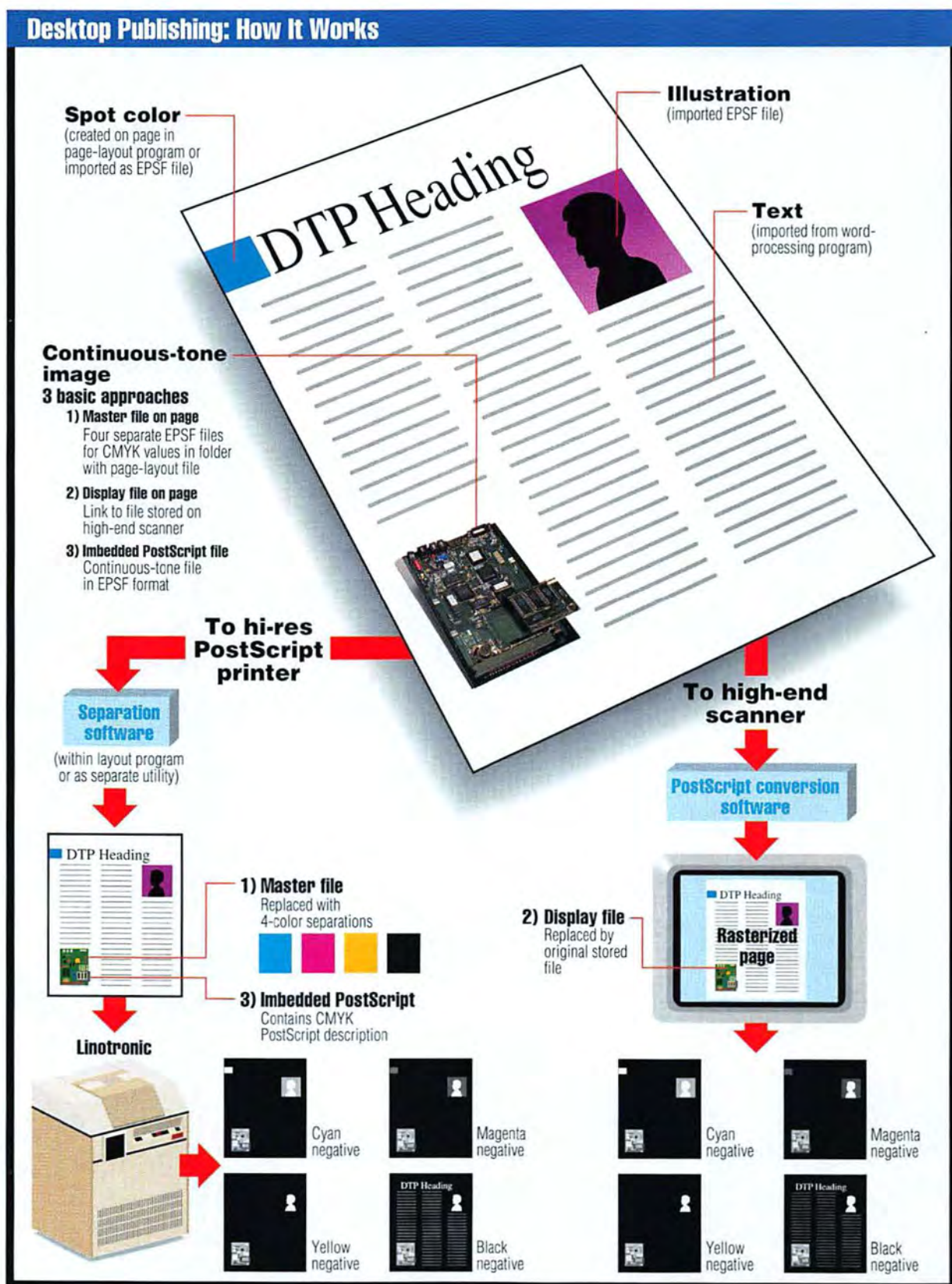


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Desktop Publishing: How It Works



text into the page-layout document. In the second (which I'll take up after the graphics discussion), you're concerned with typographic and justification considerations.

In this first stage, you're concerned with the flow of text among pages, the grid structure, and text-wrap-around boxes for graphic elements. When you import text from a word-processing program, you want to determine where the text will go and have the layout program flow the text automatically.

All the programs allow differing column layouts on the same page, with automatic text flow within each layout. They also let you place text over a graphic and vice versa. All handle text wrap in the same manner: You can run text around the rectangular graphic box, run text around an outline of a graphic, or run text behind a graphic box.

None of these programs have a menu-based grouping command. In QuarkXPress, you can group objects by manipulating parent/child relationships. PageMaker relies on Shift-clicking for temporary grouping, and Ready,Set,Go! uses the marquee tool for this purpose.

QuarkXPress has an Auto Page Insertion option in its Preferences dialog box. This option determines when and where pages will be inserted in the event of text overflow. The program inserts additional pages at the end of a story, at the end of a section, or at the end of a document. It also flows text onto the new pages automatically. Placement of objects is a very precise operation in QuarkXPress, but some designers find it cumbersome. The program lets you enter the coordinates for placing any item on a page. You can also specify the position and size of a selected text or graphic box.

PageMaker lets you flow text using one of three methods: manual, semiautomatic, and automatic. In manual, the text stops at the bottom of each column. Semiautomatic is similar to manual, except that the cursor remains as the text-placement

Page Makeup

QuarkXPress

Origin boxes for precise text placement

Dimension boxes for precise text-box size

Graphics and text boxes that can be resized on page



Text-placement box

PageMaker



Pasteboard metaphor brought to screen

Excess text that will take on page format when placed on page

Text wrap around graphics

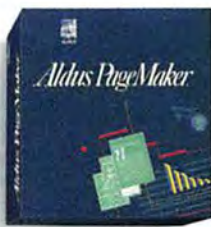
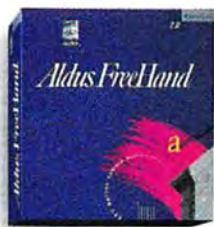
Ready,Set,Go!

Text block that must be created before placing text

Graphics box that must be created before placing graphic



Excess text that won't take on page format when placed

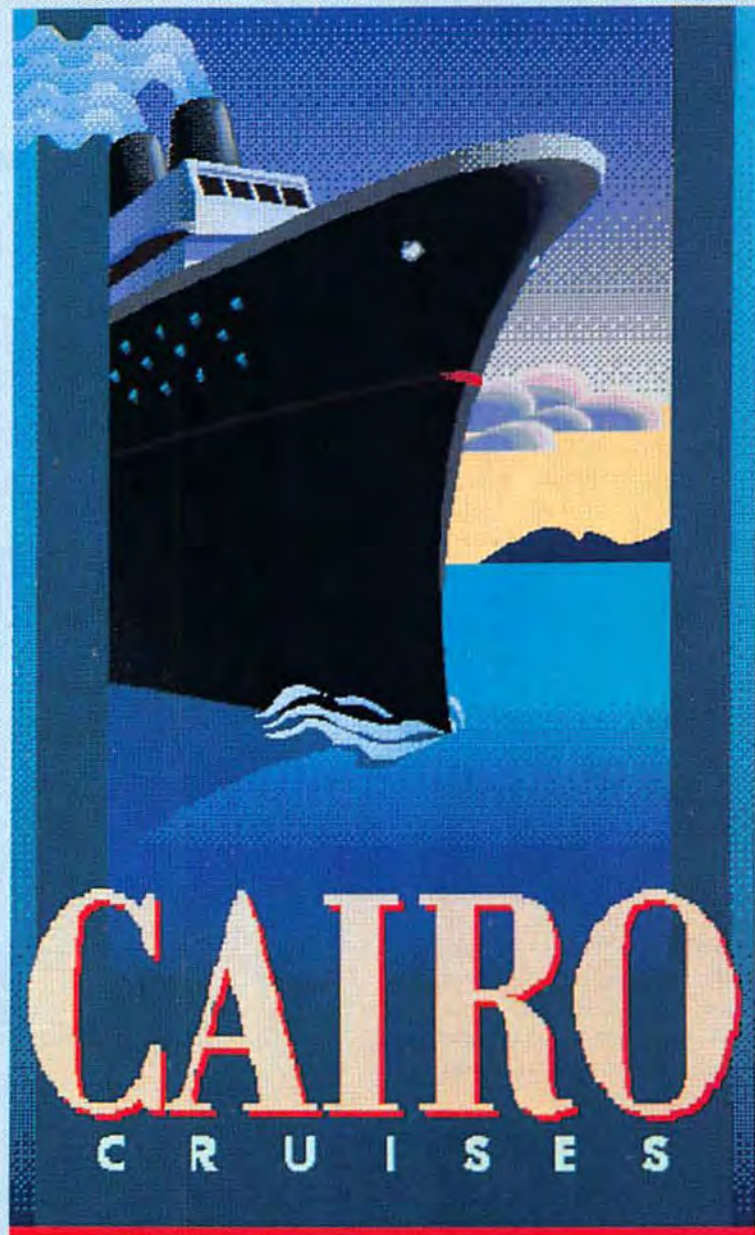


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LOOK WHAT HAP GIVE PAGEMAKE

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Page-Layout Play-offs

icon, ready to place the next column. Automatic places the entire document. The precision you achieve in placing objects in PageMaker is only as good as your hand-eye coordination in working with snap-to guides on-screen.

PageMaker's automatic page insertion is truly automatic, unlike QuarkXPress, which is menu-based. Should your publication run out of pages before you've finished pouring text, PageMaker automatically inserts pages (up to a total of 128 pages, the maximum PageMaker allows) to finish the document.

Ready,Set,Go! uses linked blocks or text frames that require you to click on each frame to be included in a particular pour. Text blocks must be linked before you can flow your document, and if you run out of frames before your document is placed, the remaining text is stored as overflow text. To display this overflow text,

you need to either change the size of the text block or create more blocks and link them to the last block of text. Like QuarkXPress, Ready,Set,Go! lets you enter the coordinates for an object when you're placing it on the page and specify the size and position of objects.

Ready,Set,Go! uses a grid structure to lay out pages. If you create an object such as a text or graphic block, the program snaps to fit one or more rectangles in the grid. When the grid is active, objects automatically snap to the nearest grid line.

I'll hold off on picking a winner in this category until I've discussed the second stage of page layout.

Graphics-Handling Basics

Graphics come in a variety of formats, and professional publishers need a layout program that can accommodate all of them or as many of the more-popular formats as possible.

All the programs accept EPSF (Encapsulated PostScript Format), TIFF (scanned images), PICT2, and bit-mapped graphics, but they vary in the amount of control users have over contrast, resolution, and position.

All the programs come with the same object-oriented drawing tools, which include tools for creating lines, circles, squares, rectangles, and ovals. You can also shade these shapes. All the programs let you resize and crop graphics and even mask them with black-and-white shapes. Ready,Set,Go! is the only program that lets you flip a graphic (180 degrees), but none of the programs let you rotate them. None of the programs let you edit imported graphics much, except for contrast and placement. For extensive altering, you have to go back to the original program and

The State of Color Separation

As of this writing, the state of color separation as a feature of these page-layout programs is disparate.

QuarkXPress is currently the only page-layout program capable of separating its own files. From the Print menu, you select Separations, and the program prints out any EPSF illustration or QuarkXPress-generated spot color along with the page as four-color separations. As an added feature, Pre-Press Technologies, in conjunction with Quark, has developed SpectreSeps XP, a QuarkXTension that lets designers place continuous-tone color images from a desktop scanner or a screen-capture utility onto the page, to be separated along with the rest of the document.

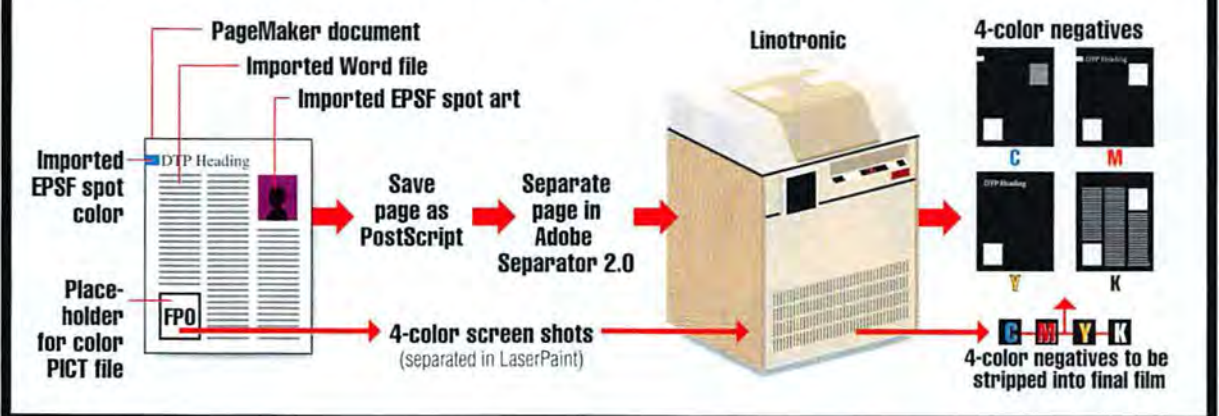
Currently, PageMaker 3.02 with Color Extension can create CMYK color on a page from within the program. However, Aldus hasn't released a separation utility as of this writing. Many magazines,

including *MacUser*, use Adobe Separator 2.0 to color-separate PageMaker files saved to disk as PostScript.

At the first release of Color Extension, Aldus said it would ship Aldus Separator, a utility that would color-separate PageMaker pages. A later version of PageMaker will also feature a Pre-Press Technologies product—SpectreSeps PM—that will let PageMaker users place continuous-tone images on a page and color-separate them, as QuarkXPress does.

Ready,Set,Go! 4.5a doesn't have color-separation capabilities. However, Letraset will be shipping its new high-end page-layout program, DesignStudio, by the time you read this. Among its features will be the ability to do full-page four-color separations (for more details, see the "Sideline Contenders" sidebar).

— Michael Yapp



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Graphics Handling

QuarkXPress

Figure 4: Placing graphics in QuarkXPress is similar to placing text. You have to enter the picture's coordinates on the page, its width, its height, its scale, text-wrap information, and background-shading information in the Picture Box Specifications box before bringing in the graphic.

PageMaker

Figure 5: PageMaker's pasteboard method forces you to rely on hand-eye coordination for placing graphics — you don't have to contend with dialog or graphics boxes. About the only element you have to pay attention to is the type of text wrap and flow you want.

Ready,Set,Go!

Figure 6: Like QuarkXPress, Ready,Set,Go! has a graphics-specification dialog box into which you enter a graphic's page coordinates along with dimensions and scaling information. Ready,Set,Go! also gives you freedom from this level of detail by letting you place a graphic on a page as you would in PageMaker. A nice feature of the Picture Block Specifications box is that it tells you the format of a graphic (for example, EPSF).

reimport the altered graphic into the layout program. (See the "Sideline Contenders" sidebar for information on Publish It!, a newcomer that has a wide selection of drawing and painting tools.)

As for ease of reimporting, PageMaker's Place option on the File menu gives you the option of replacing an entire graphic with an updated version. The reimported graphic contains the same geometry and cropping and reducing or enlarging information as the original.

Instead of providing you with a winner in each graphics category, I'll select an overall winner for graphics after the discussion of color graphics.

Gray-Scale Handling

When working with gray-scale scanned images, everything has to match perfectly, from the quality of your original scans to the quality and resolution of your output device. But even in ideal conditions, the halftone produced may not meet commercial production standards.

Through three predefined contrast settings — normal, high, and posterized — and one custom setting, QuarkXPress offers contrast controls for gray-scale and color TIFF images. (I'll take up the issue of color a little later.) The custom contrast setting represents a picture's contrast as input versus output. QuarkXPress' contrast tools let you change the contrast manually, draw freehand curves, make linear adjustments, return to the original contrast levels, flip the current contrast curve (an x,y-axes graph measuring the gray levels in the printed image over the gray levels in the imported TIFF picture), and create negatives.

PageMaker's gray-scale handling isn't as tool- or box-oriented as QuarkXPress', but with PageMaker you do have more-direct control over gray-scale images in terms of contrast — it's more WYSIWYG in its approach. You can modify scanned images in PageMaker by changing the gray levels in the image, changing the line screens for special

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Page-Layout Play-offs

effects, and increasing or decreasing the screen frequency of the image.

PageMaker also offers a virtual-memory-like feature for dealing with large (in terms of disk size) scanned images. For any image greater than 64K, PageMaker creates a low-resolution screen version that is stored with the publication and linked to the original scanned image on-disk. Any changes made to the on-screen version are updated in the original when the publication is printed.

Ready,Set,Go! can modify the gray-level information in TIFF files, either by adjusting the brightness and contrast of the image or by creating special effects such as flops, negatives, posterization, and solarization. Ready,Set,Go!'s "graymap" box shows the relationship of the shades available in the original image to the shades displayed on the screen when you print. You can manipulate this curve with the brightness or contrast sliders, with the Posterize button, or by editing directly with the mouse. You can also set the halftone screen.

Color-Image Handling

Color handling in layout programs varies. All programs display color images, but they don't all let you edit them. QuarkXPress is the only one with color-editing and four-color-separation capabilities. You can make contrast adjustments to each color component or combination of components in a color picture. QuarkXPress also lets you adjust the CMYK (cyan, magenta, yellow, and black) components individually as well as in combination (for example, cyan and yellow together) via the contrast curve. The program screens an image electronically by using one of the four predefined screens or by creating a custom screen.

By the time you read this, PageMaker's Color Extension will let you

edit an image's CMYK values. Color Extension already lets you place and display color TIFF images, but currently it can't do color separations within PageMaker. You have to

QuarkXPress is the only program with color-editing and four-color separation capabilities.

handle color separations by using the method outlined in "The State of Color Separation" sidebar.

Ready,Set,Go! also lets you place and display color images, but it doesn't let you edit or separate them. At press time, Letraset announced its new high-end layout program, DesignStudio, which will have a host of color-handling capabilities (see "The State of Color Separation" sidebar for more details).

QuarkXPress is the leader in graphics handling because of its color capabilities, particularly its ability to do separations. PageMaker is a close second because of its edge in handling gray-scale images. PageMaker lets you see the results of your contrast changes directly on-screen (no boxes).

The key to high-level graphics, gray-scale, and color is working with your service bureau. Inputting and manipulating these items on the desktop is easy; getting quality output isn't.

Final Page Layout

At this stage, you have all the elements on the pages in place (roughly, anyway), and you're ready to arrange and adjust them for the final layout. This fine-tuning involves the typographic issues of leading, pair kerning, track kerning, and hyphenation, along with vertical justification and font handling. Ideally, these typographic and justification considerations should be worked out long before you put together the final layout.

To be of any real use, a layout program should have user-definable controls for typographic adjustments.

Also, the program should let you incorporate this information into its style sheets.

QuarkXPress offers three typographic adjustments for word spacing — standard, spaces only, and uniform — which vary the amount of white space inserted between characters and between words. Standard inserts more space between words than between characters, spaces adds extra space only between words, and uniform distributes added space as evenly as possible among all characters. The program also gives you a custom pair-kerning feature. QuarkXPress doesn't have a vertical-justification command, but it does let you justify vertically through careful use of leading and baseline commands.

All hyphenation and justification controls can be included in QuarkXPress' style sheets, and the program lets you specify values for the number of consecutive hyphens, smallest word, pair kerning, leading, and track kerning. It also lets you edit the kerning table for each font size.

QuarkXPress' user-definable hyphenation controls let you determine the minimum number of characters in hyphenated words, the minimum number of letters that must precede a hyphen, and the maximum number of consecutive lines ending in divided words. It uses a combination of whole-word reference dictionary and logic-based hyphenation algorithm.

PageMaker has automatic hyphenation of text, but it doesn't provide any hyphenation-control options. The program checks the user-definable supplementary dictionary and then the built-in dictionary. PageMaker also lacks a vertical-justification command — it relies on hand-eye placement. For text justification, PageMaker lets you specify a desired word space and indicate minimum and maximum ranges within

which PageMaker can justify a column of text.

For pair kerning, PageMaker considers the built-in letter space as 0 percent of the recommended space built in by the type designer. To compose justified text, PageMaker adjusts the spacing within the desired ranges and hyphenates to fit text into the lines. It doesn't include track kerning in its style sheets, but it does let you invoke pair kerning above a specified point size. Considering that there are almost 4,000 possible pair kerns in a given font and that the average number included in most PostScript fonts is about 100, this level of control is inadequate.

Ready,Set,Go! has Type Specifications and Type Control dialog boxes that let you specify the desired pair and track kerning. This program relies solely on a hyphenation algorithm after checking the user-defined dictionary. You can define the minimum size of a hyphenated word, the minimum number of characters allowed before and after a hyphen, and the maximum number of sequential lines that are allowed to end in a hyphen.

For vertical justification, Ready,Set,Go! uses a more sophisticated technique than the other programs do, in addition to the top, bottom, or center choices. You can specify justification with feathering, in which the excess vertical space is evenly distributed among all the lines, or with paragraphs, in which the excess vertical space is evenly distributed among the paragraphs in the text block.

For page layout, particularly this second phase, you need the precision of QuarkXPress for typographic and justification adjustments, so it takes the prize in this category. PageMaker and Ready,Set,Go! tie for second place — PageMaker for its WYSIWYG approach to layout and its automatic page insertion and

PageMaker has a clunky approach to typographic functions such as hyphenation control.

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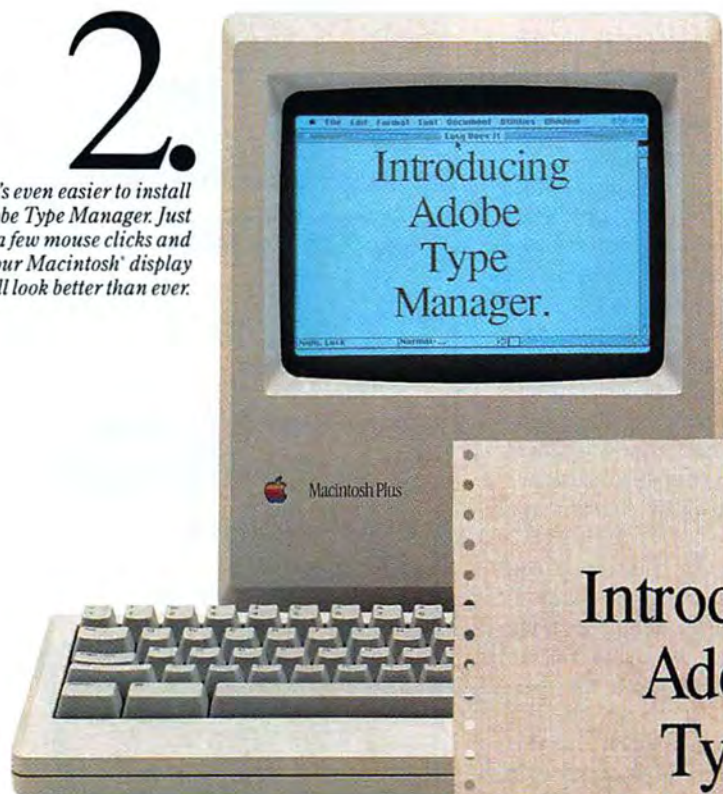
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(Middle Right) Scaling a bitmapped font is a less precise process, making the character less accurate and more difficult to read. (Far Right) When an outline font is used, the computer scales the outline to the precise size and shape, and fills it with dots. This results in a smoother, more accurate character.

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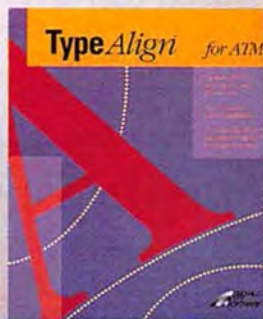
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Page-Layout Play-offs

Ready,Set,Go! for its typographic and justification controls. I also have to criticize both — PageMaker for its clunky approach to hyphenation and Ready,Set,Go! for its arduous method of text flow (adding and linking text boxes) and lack of automatic page insert.

Final Preparations and Output

Once you've finalized the layouts and placed all the graphics and color, you're ready to prep the publication for production. This includes cropping graphics, charts, and tables; positioning and scaling them; and doing color separations.

Although no layout program can do color separations of continuous-tone images, Quark and Aldus have laid the infrastructure for this task in QuarkXTensions and PageMaker Color Extension, respectively. Because color separation is such a problematic issue in desktop publishing, I've elected to cover it separately (see "The State of Color Separation" sidebar).

Traditionally, publishers have sent out their entire publication to a printer with instructions for four-color separation and stripping, cropping, positioning, and scaling. Now, however, page-layout programs link up to high-end prepress systems, which take care of all the prepress operations for entire pages.

The current high-end color prepress systems include Scitex's Visionary, CyberChrome from the company of the same name, Hell's ScriptMaster, and Crosfield's StudioLink.

PageMaker can output to the ScriptMaster system, which will read Aldus' OPI (Open Prepress Interface) PostScript files. OPI will be accessible to any page-layout program, and Quark and Crosfield have already announced they will support it.

Visionary and StudioLink have proprietary formats — StudioLink with Ready,Set,Go! and Visionary with QuarkXPress. To work with Visionary, designers must have a special version of QuarkXPress. They don't have to have a special version of Ready,Set,Go! to work with the Crosfield system, however.


What's Missing, What's Ahead

Conspicuously absent from my previous discussion is editing on the page. Although all page-layout programs let you do simple editing, such as correcting typos, none are really set up for major editing on the completed page. To make changes on-screen in a page-layout program, you have to increase the point size to at least 30 points or work in 200 percent view to see what you're doing.

You can do some editing in the form of spell checking and search

and replace in QuarkXPress and Ready,Set,Go!, but PageMaker still lacks these facilities. Most importantly, there are no links back to the word-processing files. If you reimpose an edited word-processing file, it won't reflect any changes a designer may have made to the previous version placed in the page-layout program.

Another lackluster feature in these programs is graphics-handling and color capabilities. But since we're asking a relatively inexpensive hardware/software combination to replace a million-dollar machine, being too critical of these programs in this area is unfair. QuarkXPress shows the most promise here, at least in terms of color. Quark also recently introduced QuarkXTras, which give QuarkXPress more high-end graphics capabilities such as scanning and substitution of Adobe's recommended screen values for separated artwork.

In the next year, the competition for color and graphics handling should heat up, with DesignStudio from Letraset and Aldus' improvements to Color Extension and the introduction of Aldus Separator. 

Robert Virkus is president of MicroMedia, an electronic-publishing consulting firm based in Montclair, New Jersey. He started desktop publishing when he connected a LaserWriter to a Texas Instruments PC in 1984.

The Bottom Line

So which layout program should you buy?

Some publications work with two programs on a regular basis. One publication, for example, may use PageMaker for its feature pages, which change every issue, and QuarkXPress for its regular department pages, which remain the same through every issue. Other publications, such as MacWeek, have their art department use PageMaker for page design and the production department use QuarkXPress to implement these designs because of its precision in placing page elements.

Forced to choose one program, however, I'd have to give the edge to QuarkXPress because of all its features. It does full-page color separations of its own pages, it has more text-editing capabilities, and it has more typographic control than the other programs. It also affords you more flexibility in working with different word-processing files. Typographers and others with typesetting backgrounds like

QuarkXPress' precision and control over all elements.

In a subjective comparison, however, PageMaker would come out on top because of its ease of use and Aldus' installed training force, installed user base, and technical support. Designers prefer PageMaker because it automates the design process they're used to — it best emulates the pasteboard paradigm.

Ready,Set,Go! is also excellent for producing quality publications, but it doesn't afford you the graphics, text, and layout capabilities of the other two programs. It is easy to use and incorporates some of the box orientation of QuarkXPress and master pages of PageMaker. And it does have a big advantage over the others: It offers thumbnail views of documents, which let you add, delete, or rearrange the order of pages.

DesignStudio from Letraset should make this competition much more interesting in the months ahead.

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Page-Layout Play-offs

Table 1: Features Comparison

	Aldus PageMaker	Letraset Ready,Set,Go!	Quark QuarkXPress
Version	3.02CE	4.5a	2.11
List price	\$595 + \$195*	\$495	\$795
Memory required	1 MB	1 MB	1 MB
Disk storage required	hard disk	two 800K drives	hard disk
System version required	4.1	4.1	4.2
Pages per document	128	limited by RAM	limited by disk space
Number of open documents	1	limited by RAM	7
Add-on modules	no	no	XTensions
Page Layout			
Maximum page size	17 x 22 inches	99 x 99 inches	48 x 48 inches
Maximum size of page view	400 percent	200 percent	400 percent
Thumbnail view	printed only	on-screen, printed	printed only
Editable thumbnails	no	no	no
Interactive master pages	yes	yes	no
Grids/guides	guides only	both	guides only
Columns per page	20	unlimited	unlimited
Adjusts text if columns change	yes	yes	yes
Automatic text flow	yes	yes	yes
Inserts/removes pages	yes	yes	yes
Rearranges page order	no	yes	yes
Pastes object in same position	no	yes	no
Step and repeat	no	yes	yes
Locks elements in place	no	yes	yes
Multiple object selection	yes	yes	no
Object grouping	no	no	yes†
Text wrap around objects	yes	yes	yes
Text wrap inside objects	no	no	no
Bleeds object across pages	yes	yes	no
Rotates text/objects	no	no	no
Undo command	yes	yes	yes
Headers/footers	yes	yes	yes
Automatic "continued" lines	no	yes	yes
Automatic figure numbering	no	no	no
Automatic bulleted paragraphs	no	yes	no
Precise numeric size/positioning	no	yes	yes
Shows size of selected graphic	no	yes	yes
Shows cursor position on ruler	yes	yes	yes
Shows cursor coordinates	no	no	yes
Ruler measurement units	inches, inches decimal, millimeters, picas, ciceros	inches, centimeters, picas	inches, inches decimal, millimeters, picas, points, ciceros

*PageMaker Color Extension is a \$195 add-on for the PageMaker 3.0 family.

†Frames within frames are grouped as daughters of the outermost frame.

‡Dictionary hyphenation with user-exception dictionary.

§Color separations will be performed by Aldus Separator, a separate utility that was not shipping at press time.

* *Color TIFF images can be separated with Pre-Press Technologies' SpectreSeps, available as a separate utility for PageMaker and as an XTension for QuarkXPress.

††Requires a special version of the program for Scitex; links to Atex and DEC TMS are available through third-party XTensions.

This table was compiled with the help of Electronic Directions, a New York-based training and consulting firm that specializes in electronic publishing and multimedia.



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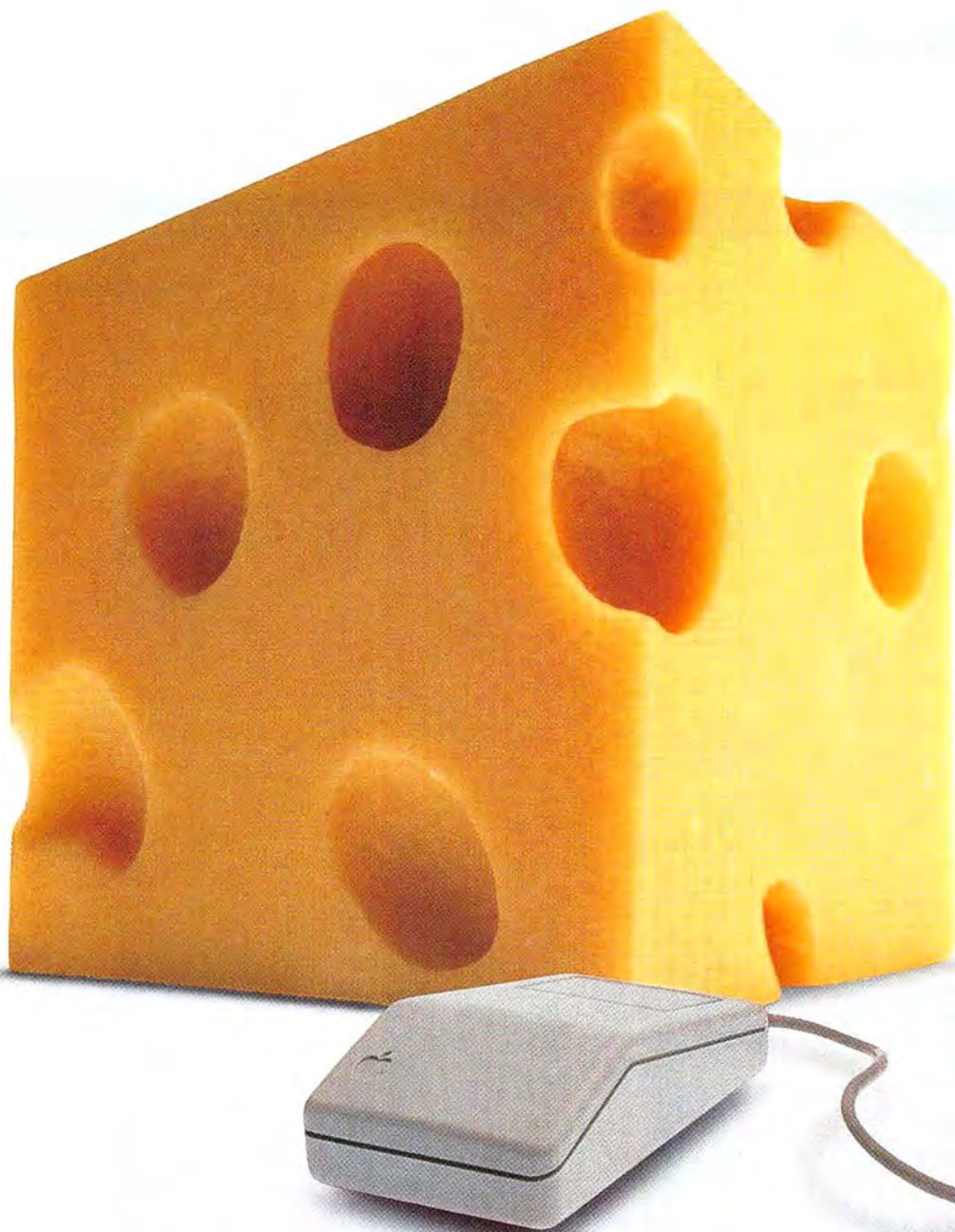
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Page-Layout Play-offs

Table 1: Features Comparison (continued)

	Aldus PageMaker	Letraset Ready,Set,Go!	Quark QuarkXPress
Text Editing			
Style sheets	yes	yes	yes
Retains font, text attributes, indents, and tabs from word processor	yes	yes	yes
Retains word-processing style sheets	Word only	no	Word only
Maximum tabs per line	20	10	20
Tab leaders	yes	yes	yes
Widow/orphan control	no	yes	yes
Small caps, all caps	yes	yes	yes
Superscripts/subscripts	yes	yes	yes
Search and replace	no	yes	yes
Spelling checker	no	yes	yes
Thesaurus	no	no	no
Text-import formats	MacWrite, Word, Works, WriteNow, ASCII, some PC files (WordPerfect, WordStar, XyWrite III, IBM DCA)	MacWrite, Word, Works, WriteNow, WordPerfect, ASCII	MacWrite, Word, Works, WriteNow, WordPerfect, ASCII
Typography			
Type sizes (points)	4 – 127 pts	2 – 327 pts	2 – 500 pts
Size increments (points)	.5 pt	.01 pt	.25 pt
Maximum number of typefaces	unlimited	unlimited	unlimited
Reversed type	yes	yes	yes
Hyphenation (dictionary/logic)	dictionary	logic ^s	both
Hyphenation control (on/off)	yes	yes	yes
Control over consecutive hyphens	no	yes	yes
Subparagraph hyphen control	no	yes	no
Discretionary hyphen	yes	yes	yes
Adjustable leading	yes	yes	yes
Leading increments (points)	.5 pt	.01 pt	.001 pt
Kerning (automatic/manual)	both	both	both
Kerning increments	.04 em	.001 em	.005 em
Adjustable tracking	no	yes	yes
Tracking increments	NA	.001 em	.005 em
Adjustable letterspacing	yes	yes	yes
Adjustable word spacing	yes	yes	yes
Baseline shift	no	yes	yes
Vertical justification of text	no	yes	no
Font rendering	no	no	yes
Graphics			
Line widths (points)	hairline to 12 pts	hairline to 8 pts	hairline to 504 pts
Line styles	solid, dashed, double	solid, dashed, double	solid, dashed, double, arrowheads
Reversed (white) lines	yes	yes	yes
Rectangles	yes	yes	yes
Rounded corners	yes	yes	yes
Circles/ovals	yes	yes	yes
Polygons	no	no	no
Arcs and Bezier curves	no	no	no
Pen and fill patterns (choices)	18	52	none
Draw and edit bit-map regions	no	no	no
Scaling/cropping	yes	yes	yes



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Table 1: Features Comparison (continued)

	Aldus PageMaker	Letraset Ready,Set,Go!	Quark QuarkXPress
Numerical scaling	no	yes	yes
Adjust gray-scale images	brt, contrast, gamma	brt, contrast, gamma	brt, contrast, gamma
Halftone control	yes	yes	yes
Graphic-import formats	paint, PICT, PICT2, TIFF, color TIFF, EPSF, color EPSF	paint, PICT, PICT2, TIFF, color TIFF, RIFF, EPSF, color EPSF	paint, PICT, PICT2, TIFF, color TIFF, RIFF, EPSF, color EPSF, DCS
Color Features			
Creates internal color elements	yes	yes	yes
Colored text	yes	yes	yes
Pantone (PMS) library	yes	yes	yes
Color models	RGB, HSB, CMYK	RGB, HSB	RGB, HSB, CMYK
Spot-color separations	yes	yes	yes
Four-color separations	yes ²	no	yes
Formats separated	EPSF, PICT, internal objects ^{3***}	NA	EPSF, internal objects**
Output Options			
Crop marks	yes	no	yes
Registration marks	yes	yes	yes
ImageWriter output	yes	yes	yes
QuickDraw printers (incl. color)	yes	yes	yes
PostScript printers (incl. color)	yes	yes	yes
Imagesetters	yes	yes	yes
Link to prepress system	via OPI	Crosfield	Scitex ^{††}
Supports Open Prepress Interface	yes	no	yes

Report Cards

PageMaker 3.02CE

★★★★

Through Color Extension, PageMaker offers users the ability to edit the CMYK values in a color image. The program also gives users flexibility in creating a publication through its pasteup approach to page layout.

Pros: True WYSIWYG approach to layout; automatic text flow and page insertion; less structured in overall operation.

Cons: No search-and-replace function; no color-separating capabilities; relies on hand-eye placement for vertical justification.

List Price: \$595.
Aldus Corp., 411 First Ave. S., Seattle, WA 98104; (206) 622-5500.

QuarkXPress 2.12

★★★★1/2

QuarkXPress is a tool that emphasizes precision and control in page design and layout. The program offers users complete control over typographic functions such as hyphenation, pair kerning, track kerning, and leading.

Pros: Menu-based color-separation capability that lets users do full-page four-color separations; user-defined controls for typographic functions; powerful search-and-replace feature.

Cons: Control elements are too cumbersome; page-layout approach steps away from the true WYSIWYG approach of PageMaker.

List Price: \$795.
Quark, 300 S. Jackson, Suite 100, Denver, CO 80209; (303) 934-2211.

Ready,Set,Go! 4.5a

★★★★

Ready,Set,Go! walks the middle ground between precision and true WYSIWYG page layout. It combines word processing, typographic controls, gray-scale editing, and spot color with page layout.

Pros: Strong editing capabilities such as search and replace; thumbnail views; ability to justify vertically by distributing excess white space evenly among all lines in a text block.

Cons: Arduous method of text flow; limited color capabilities; control over typography isn't as strong as QuarkXPress'.

List Price: \$495.
Letraset, 40 Eisenhower Drive, Paramus, NJ 07653; (201) 845-6100.

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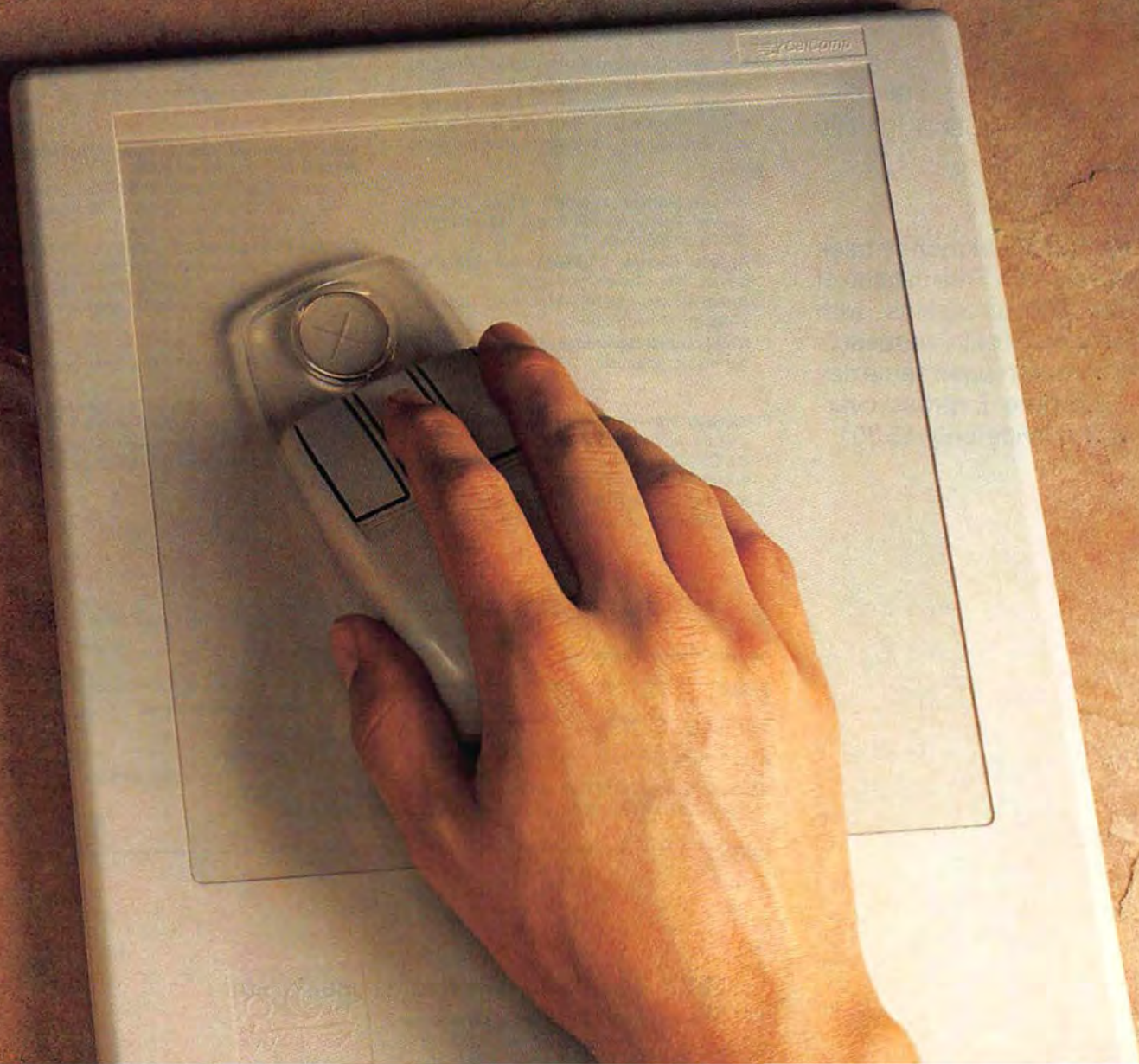
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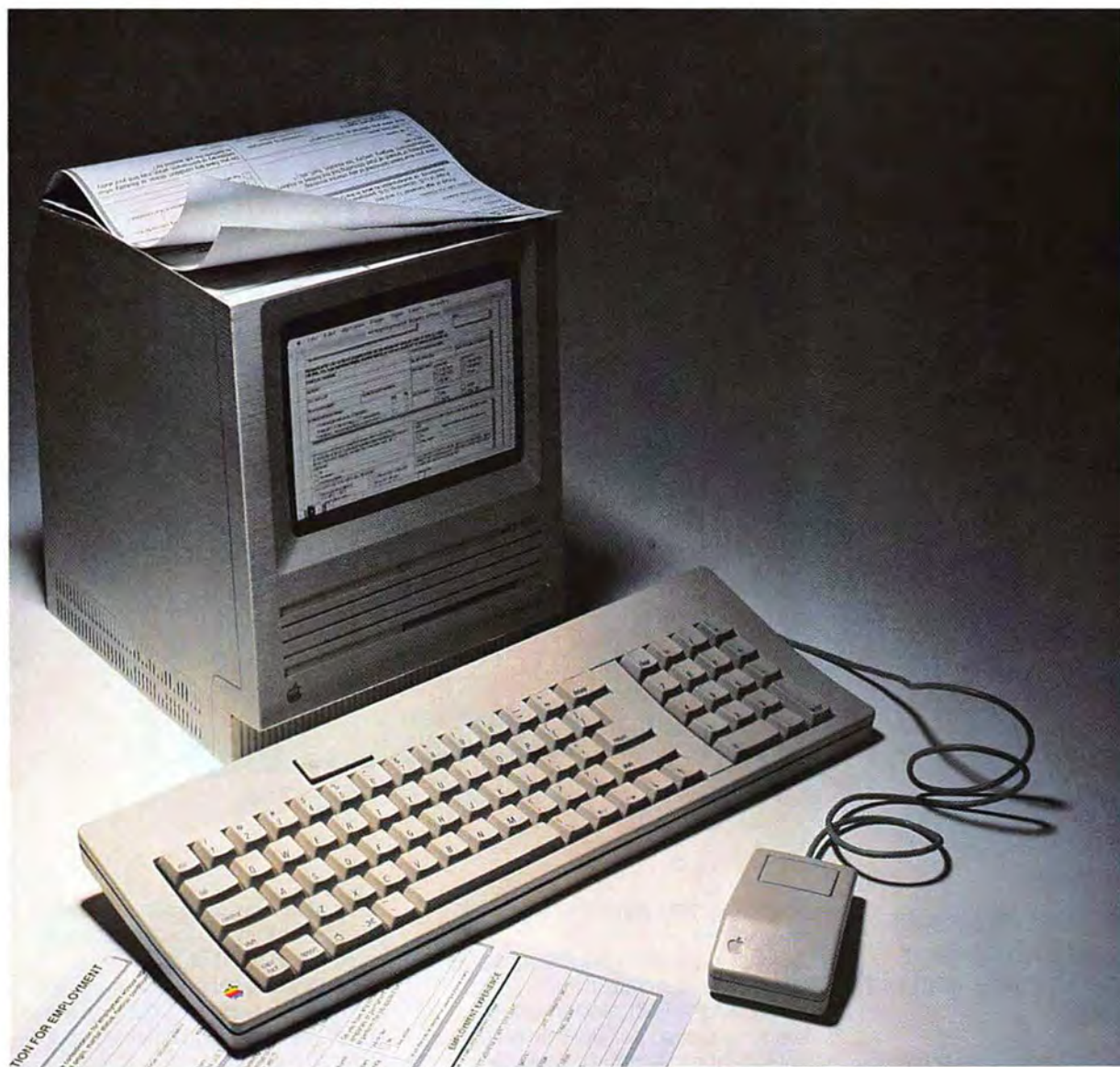


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In Good Form



Can electronic forms replace the paper variety? Here's a look at what the top forms-management programs can do.

By Ben Templin

Nobody likes to fill out forms. But forms are a way of life in government and business alike. The three forms-management programs reviewed here can make our forms-cluttered lives easier. They serve as a bridge to bring the paper world into sync with the electronic

one. By using a computer to fill out forms, you harness the power of simple calculations; mathematical formulas; and, in some cases, databases to access names and addresses. This makes filling out forms easier and reduces the margin for error. Forms packages may be the best way for the traditional paper-based office to make that sometimes scary leap into using computers.

Big-league stats for the serious player.

LEE NATHAN
Research Division Manager

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Two of the three programs have been upgraded to new versions: Claris' SmartForm is now in version 1.1 and Adobe's TrueForm is in version 2.0. A third program, Fast Forms, was acquired by Power Up! from its Canadian developer, Shana, in 1989.

Design Your Own

These programs take two approaches to design — scanning the original paper form or creating one from scratch. Scanning forms is faster but often suffers from poor screen quality. Creating forms from scratch gives you more control over the final look of the form. SmartForm and Fast Forms have design environments (Claris' is called SmartForm Designer) in which you create a form. Although SmartForm also lets you import scanned images (in PICT format), it provides drawlike tools for sketching out designs — similar to a page-layout program. Fast Forms lets you import images only through the Clipboard — a workaround solution at best — and has most of the draw tools you need to create simple forms. Both programs offer the usual Mac desktop-publishing options: You can define space in inches or points; a snap-to grid aligns objects; and all the fonts, sizes, and styles you have installed are available.

The difference between these programs becomes clear when you boot them up. Anyone familiar with the Macintosh interface can create a basic form by pointing and clicking within SmartForm. Fast Forms has a non-standard Mac interface, however. Its Font and Style menus are inside a window, not on the menu bar.

Neither SmartForm nor Fast Forms is a great design tool. The largest forms maker of them all, the IRS, uses PageMaker, and if you primarily use paper forms, you'd be better off using a dedicated desktop-publishing program too. But DTP was never meant to be the first priority of forms-management programs. In fact, they have sacrificed some traditional DTP tools to give power to the primary utility in forms management —

Electronic forms processing lets you do simple calculations, use mathematical formulas, and access database address files.

filling out the forms on the computer.

TrueForm has no page-layout capabilities. You need either a scanner to digitize a preexisting paper form or a design environment (Adobe recommends Illustrator 88, of course) to create the form. TrueForm scans documents from within its TrueForm Set-Up program. It supports numerous scanners from companies such as DEST, Sharp, Canon, Fujitsu, and Apple. A compression algorithm makes the scanned-image files smaller than normal TIFF files. (Otherwise, the TIFF file would make the form an unwieldy size.)

While scanning is a good way to retain continuity between a paper form and an electronic one, the on-screen results are not always the best quality. Forms are often designed in an 8-point type size or smaller. A scanned image with such small type can be pretty hard to read on a Mac monitor. A draw palette would be

welcome for modifying some elements of the original form. It's best to have a program with a design environment built in.

Out in the Fields

After page layout, the next step in forms design is to define fields for entering information. Field tools lay boxes down on a grid. In SmartForm and Fast Forms, you size a field box with a field tool as you would a rectangle in a draw program. TrueForm automatically sizes the field box to the form you've imported as a grid, a feature that speeds up field construction. The field box can be resized in all the programs.

Field boxes can be defined as text, numbers, dates, or other formats. Fast Forms lets you designate numbers as integer, decimal, or dollar amounts; SmartForm and TrueForm have more formatting options (this holds true for almost any element in a comparison of these programs). TrueForm goes the furthest in number formatting. You can customize the numbers, for instance, to separate the millions', thousands', and hundreds' places with periods instead of commas (a European convention).

Once you've defined what type of information goes into each field, you can link the boxes to perform calculations. Common functions (such as multiplication, division, addition, and subtraction, as well as greater than, lesser than, and equals) are supported by all the programs. In SmartForm



Figure 1: Claris' SmartForm supports many built-in functions and operators to build formulas. Shown here is the final total of several subtotals being applied to a field on an invoice form.

and TrueForm, even-more-complicated relationships can be defined. You can average several numbers or do a logarithm, which requires using the program's scripting language. Formulas are convenient to build from lists that contain operators and functions (see Figure 1). SmartForm and TrueForm also support logical operators (IF, AND, OR, NOT) for formulas based on conditions. A time card, for example, can be set to automatically raise an hourly wage to time-and-a-half when more than 40 hours are reported.

Both SmartForm and TrueForm have functions that manipulate text. A concatenating function lets you define a field as a word and then join fields in a phrase. For example, you

may want an entry form to yield the phrase "Meet (name) at (time)." (Name) and (time) are variables that the user enters.

Function Follows Form

The real power in these programs lies in the filling-out stage. SmartForm and TrueForm use separate applications. SmartForm Assistant and TrueForm Fill-Out, respectively, for this purpose. Fast Forms' fill-out program is a DA — a good solution for a business that wants to run an accounting program or a database as its primary application.

When you fill out a form with any of these packages, the master form is not altered. Even though you open the master form within the fill-out

application, any data you enter must be saved in a different format.

Automation is the key to filling out forms. How many rote tasks can the computer do? All the packages fill in the date automatically — you define the field and the way of displaying the date (1/5/90; Jan 5, '90; January 5th, 1990; and the like) in the setup stage. SmartForm adds the option of changing the date to when the form is created, filled out, or printed.

Each program tries to reduce human error. If you enter information that doesn't match the field type (such as a letter instead of a number), each program responds either by not accepting the data or by displaying an error message.

To further reduce the chance of

Forms and Database Management

Forms-management programs are, in many ways, databases without the data. They make it easy to input information that was traditionally written on paper forms. But storing that information and manipulating it in different ways is not within the power of these programs. Why, then, use a forms package rather than a database manager?

Until recently, many database programs lacked well-designed forms capabilities. The front end didn't look like traditional paper forms either on-screen or on paper. What's more, you couldn't easily set up a database that imitated the data-entry sequence of a complex form. This made it difficult for some office workers to make the leap from paper to computer — hence the intermediate virtue of forms packages. But breaking forms away from a database is like stripping the engine out of a sleek racing car. It looks nice, but it doesn't go anywhere. The temptation is to return to upgraded databases such as Claris' FileMaker II or ACIUS' 4th Dimension, which have good forms capabilities and give you data management as well. You pay more for the increased power, however, and you have to deal with the complex, time-consuming process of database form building.

Adobe offers a compromise. TrueForm is the first forms program to link up with a database, 4th Dimension (somewhat ironic, since 4th Dimension 2.0 has a much improved forms capability). A printing module lets you print TrueForm forms from within 4th Dimension. You can also use 4th Dimension data to create a TrueForm stack or add to an existing stack. But this is a one-way approach to the database-link problem. You also want to be able to enter data into the TrueForm sheet and have it slide transparently into a database, which isn't possible with this release.

To export data from any of the programs into a database, you must save the data in a text file. SmartForm also lets you save the data in SYLK, DBF, DIF, WKS, or tab-delimited files. TrueForm goes the extra yard by letting you designate which fields you want to export (see Figure A). Sets of export settings can be saved and chosen for different occasions. A tab, Return, or some other character can separate fields.

But exporting data is a workaround at best. If forms programs are not going to provide database capabilities, they need to be a transparent front end to databases so that you can harness the relational capability of databases such as 4th Dimension, FoxBASE+, Omnis, or Double Helix. The only other strategy is to build the shell of a form in a program such as SmartForm and then cut and paste it into your database, adding the entry fields from within the database itself — another workaround. Clearly, forms programs need to include more-sophisticated features before they can be considered viable alternatives to databases that have good forms capabilities built in.

— Ben Templin and Michael Miley



Figure A: TrueForm lets you import or export data (the process is called merging) from or to spreadsheets, databases, accounting packages, and other computers. A handy feature, Merge Sequence, lets you select the order of the fields to be merged so you don't have to change the arrangement of data on the form to fit another format.

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In Good Form

errors, SmartForm and TrueForm let you select information from a predefined list. For example, you might create a list from which to choose items for invoices. You can also include pop-up instructions for each

field, a particularly useful feature in TrueForm, where the on-screen resolution of a scanned form can be difficult to read (see Figure 2). To further automate the filling-out stage, TrueForm and SmartForm can set up fields

that depend on other fields. For instance, you can have the price of an item appear automatically when you type the product name.

Filling a form out on a large screen is not dissimilar to filling one out on

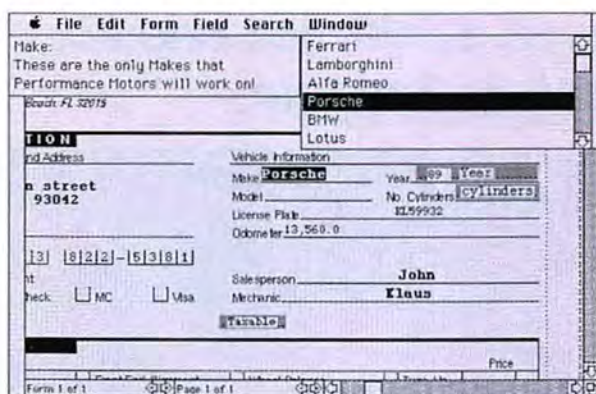


Figure 2: TrueForm lets you create pop-up instructions for fields. Choose the Info button during the design process to assign the data to a field. In this example, click on Make, and a list appears with an explanation. Click on Porsche, and it fills in the blank.

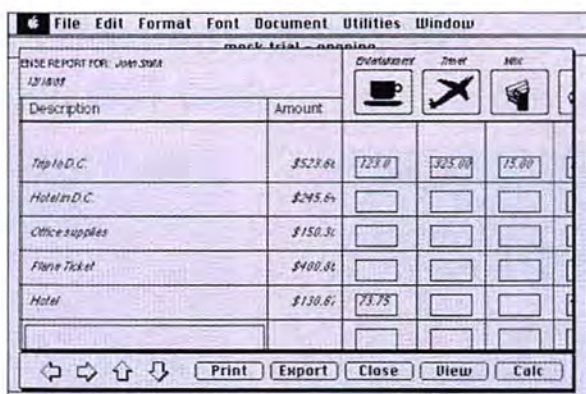


Figure 3: The Fast Forms DA lets you fill out an already designed form, but the interface is less than intuitive. There are no menu commands — you print, scroll, and close by clicking on the buttons and arrows at the bottom of the form.

Beta Watch

1stSCAN

For now, stay away from 1stSCAN from 1stDESK. 1stSCAN, despite its name, does not scan forms. It does, however, open MacPaint or PICT files. The documentation (which is poor) says it also opens TIFF files (the standard format for most scanners), but the version sent to us for review (version 4.1) did not recognize the TIFF format. 1stSCAN has the same limited features as Fast Forms but none of its simplicity.

1stSCAN's feature set is confined to calculations such as addition, subtraction, multiplication, and division. The Calculate command has to be invoked instead of being automatic. When searching for a particular form in a database of forms, you can easily wait a long time for nothing to happen. Even at beta time, 1stScan isn't in the same class as the other programs.

\$195. 1stDESK Systems, Inc., 7 Industrial Park Road, Medway, MA 02053; (508) 533-4925.

Informed Designer

Informed Designer, which was not released at press time, comes from Shana, creator of Fast Forms. Informed Designer is

more Mac-like and more similar to a desktop-publishing tool than Fast Forms, giving precise layout controls. It has pattern menus, a specs palette, and "nudge" commands. In field calculations, it supports more-sophisticated formulas, such as logarithms and concatenations, and its search function for a forms stack seems more sophisticated than SmartForm's or TrueForm's (see Figure B). Database links are alluded to in the beta manual. Considering its projected price, Informed Designer may be the best value going.

\$295. Shana Corp., Suite 105, 9650 20th Ave., Edmonton, Alberta T6N 1G1, Canada; (403) 463-3330.

SoftView FormSystem

At press time, SoftView, the maker of MacInTax (an excellent personal-income-tax-form generator that is approved by the IRS), was working on SoftView FormSystem, a forms generator that is scheduled to debut in January 1990. FormSystem promises a new concept in forms generation, *graphics intelligence*, in which every field and element on a form is aware of its relationship to all

the other elements of the form. Thus, when one element is changed, the spacing and alignment of all the others are automatically adjusted — a godsend for creating complex forms.

\$99. SoftView, Inc., 1721 Pacific Ave., Suite 100, Oxnard, CA 93033; (805) 385-5000.

— Ben Templin



Figure B: Informed Designer, soon to be released by Shana, promises precise tools for easy creation of complex forms. Sophisticated formatting options, an advanced search function, and on-line help are available on the menu bar.

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In Good Form

paper. On smaller screens, however, full-page forms scroll across and down the page as you tab to new fields. Multipage forms just scroll to the next page. You can define the order of the tab sequence in all three programs.

Fast Forms' interface gets in the way of filling out forms. The DA window has no scroll bar or close box (see Figure 3). You maneuver around within the form by using arrows at the bottom of the screen.

SmartForm and TrueForm let you group related forms. SmartForm has Form Sets, and TrueForm has Stacks (no relation to HyperCard stacks). Both Form Sets and Stacks save only one image of a form while keeping all the data behind it in a databaselike file. You can perform common search functions within a Form Set or Stack. For instance, you can search for all the forms created within a certain time period. You can also search for text strings and for multiple criteria

— such as all sales totaling more than a hundred dollars made by a particular clerk. Each program is capable of grouping forms that meet your search criteria.

Fast Forms holds data for multiple forms in a text file. You use the Fast Forms DA to print forms as you fill them out, and you use the Export File function to put the information into a database.

None of these programs fill out forms particularly speedily. The more

The Elements of Business-Form Style

Good forms design requires a logical, visual arrangement of a form's components to help users supply or retrieve data accurately, completely, and swiftly. Unfortunately, none of the forms-management packages discussed here can ensure that users will design forms in such a manner. So novice forms designers should consider these basic tips:

A good form is intuitively simple to fill out, but if instructions are necessary, they should be at the *top* of the form, where users will encounter them *before* they fill out the form. Only routing instructions should be at the bottom.

Use upper-left-corner captions in boxes to prompt users, so that the captions are out of the way of the information being written into the data field (see the first form example).

Without contrary knowledge, assume that any form may be filled out by using a typewriter or a computer. It should accommodate character fields in sixths of an inch vertically and tenths of an inch horizontally. Manually completed forms should allow at least one-fifth of an inch for each handwritten character.

Use comb tick marks in only two circumstances: to remind users to supply every required digit in a field — such as a Social Security number — or to prevent them from entering an unlimited number of characters in a field that must be stored in a fixed-length database column.

Use a sans serif typeface such as a medium-weight Helvetica or Univers for small prompting captions. A style with ornamental serifs may break up at low resolutions, and fonts with small x heights are harder to read at the small sizes of forms captions. Text with uppercase and lowercase letters is easier on the eyes than all caps.

The data written on a form should not have to compete with the form itself for attention. Use hairline (half-point) rules; occasionally you might use slightly heavier (1-point) rules to divide the form into distinct zones of related data. Avoid nonfunctional vertical rules that interrupt the horizontal flow of information.

Use lightly tinted backgrounds to highlight related areas of the form, such as "for office use only" sections. Be careful, though — a coarse tint pattern produced on a low-resolution laser printer can obscure the legibility of any text written into a tinted field.

Combine forms that are always attached and travel together. Allow extra-wide margins for forms with binding or hole-punching requirements. Do not preprint anything on a form that can change frequently — such as routing instructions to a specific person who may be gone the next day — when the same instructions can be expressed in a

more permanent way such as routing to a department or title.

For more information on forms analysis and design, consult *Forms for the '80s: How to Design and Produce Them*, a source book edited by Gar Raines (Philadelphia, Pennsylvania: North American Publishing Co., 1980), or the even more comprehensive *Business Forms Handbook*, third edition, by John P. Schied (Alexandria, Virginia: National Business Form Association, 1984).

— Jay Zilber

Name	Social Security Number		
Address	Phone Number		
City, State, Zip Code	Age	Sex	

When the prompting captions of a form are in the upper left corner, they are out of the data's way and the entire space can be used more efficiently for data entry.

NAME			
ADDRESS			
CITY, STATE, ZIP			
PHONE NUMBER	SOCIAL SECURITY NUMBER	AGE	SEX

Other commonly used form designs are less efficient or, worse, more confusing and harder to fill out. Placing captions under a series of unconnected rules makes it unclear whether the data should be entered above or below the rule.

NAME	AGE	
ADDRESS	SEX	
CITY	STATE	ZIP CODE
PHONE NUMBER	SOCIAL SECURITY NUMBER	

Captions with trailing rules waste considerable space. Such forms must be larger, or the data will be forced into truncated spaces or arranged haphazardly.

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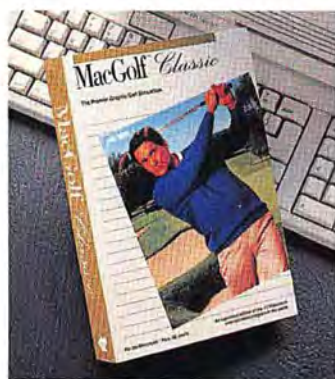
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MacGolf Classic (XOR Corp.)

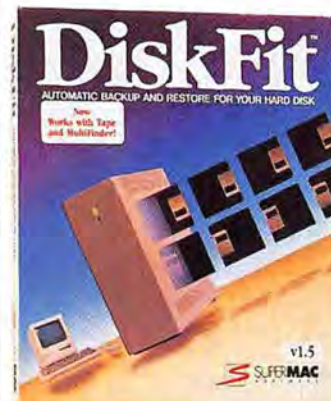
You won't be in the rough when you play MacGolf. This is the premium edition of MacGolf, featuring vivid full-screen color graphics with unsurpassed screen image detail. Contains the original 2 MacGolf courses and 4 additional MacCourses, for a total of 108 holes to play. New features include 5 enlargement options for close-up viewing, 9 practice greens, a driving range, installability on hard disks and much more. Plus, SE, and II. (entertainment) \$53.

ACCESSORIES

Apple	
Toner Cartridges LaserWriter	109.
Avery Labels (full line available)	
Color Coded 3.5 Diskette	4.
Laser 3.5 Diskettes	29.
Laser File Folders	6.
Laser Transparencies	22.
Basic Needs, Inc.	
HardTop Keyboard Covers	15.
HardTop ImageWriter Covers	17.
Keyboard Flip	6.
Dust Covers - Grey Nylon Ripstop	
ImageWriter or LaserWriter	12.
Mac Plus and keyboard	11.
Mac SE and extd. or reg. keyboard	11.
Mac II and extd. keyboard	12.
Large Screen Monitor Stand	39.
Universal Laser Printer Stand	28.
Computer Friends, Inc.	
MacInker (IW & IW II)	41.
Curtis	
Computer Tool Kit (52 pc.)	49.
Curtis Clip	6.
Disk Holder (holds 40)	9.
Jewel Surge Suppressors	Call.
Ergotron	
MacTilt SE	68.
MacTilt II-RGB	75.

Goldstein & Blair

The Macintosh Bible	20.
I/O Designs	
ImageWare II Carrying Case	49.
Macinware IIcx Carrying Case	89.
Macinware Mac II Carrying Case	99.
Macinware Plus Carrying Case	64.
Macinware SE Carrying Case	75.
Monitorware Apple RGB Case	79.
Ribbons black	4.
Kalmar	
Rolltop Teak disk holder 45	14.
Rolltop Teak disk holder 90	21.
Kensington	
Anti-Glare Filter	33.
Apple Security Kit	34.
Mac II Stand w/Cable Kit	64.
MasterPiece Mac II	105.
PowerBacker 360 UPS Line	269.
PowerBacker 800 UPS Line	749.
PowerBacker 1200 UPS Line	949.
System Saver	63.
Mobius Products	
Cordless Mouse	99.
Fanny Mac QT	59.
SE Silencer	39.



DiskFit 1.5 (SuperMac)

A handy utility for backing up your hard disk on a series of floppies. It saves time because it backs up only those files which have changed since the last backup. DiskFit can verify each floppy after copying files onto it, so you know that your files are safe. DiskFit also discards old versions of files so your backup set doesn't keep growing. Version 1.5 supports a variety of cartridge tape drives, including the Apple tape backup system. (utilities) \$59.

Polaroid

Circular Polarizing Filter	35.
Read-Write	
CompuDuster	29.
Kleen & Dry CRT Pads	5.
Computer Care Kit	45.

Macinware Carrying Cases (I/O Designs)

The I/O family of carrying cases protects your Mac and it's peripherals against damage whenever you need to take your Mac on the road. The outer covering is made of luggage quality lightweight woven nylon with web strap reinforcement.

The SE Extended Case has an inside padded compartment that can accommodate the extended keyboard. The interior is padded to protect the equipment. Comes in Black or Navy. (accessories) SE Extended Case \$69.

DataStor 8000-Personal Organizer (Microlytics)

Organization in a nutshell! DataStor 8000 Personal Organizer is a portable, pocket-size information manager that reminds, notes, files, transfers, calculates and organizes your life. Carry important information with you by down loading it from your computer to the Personal Organizer. When you return, any information you entered can be easily uploaded to your computer. It's all you need to get on top of things...and stay there. (hardware) \$65.

Smack-a-Mac

Smack-a-Mac	9.
SoundSight	
FastKeys 2.0	35.
Targus, Ltd.	
Deluxe Plus/SE-XKB Case (black)	69.
ImageWriter II Case (black)	49.
Mac Plus/SE Case (black)	55.

ACCOUNTING AND PERSONAL FINANCES

Aatrix	
Checkwriter	37.
Payroll 3.5	109.
Payroll PLUS or TimeMinder	ea. 149.
Bedford (Computer Associates)	
Simply Accounting	209.
Brown-Wagh Publishing	
MacLedges	159.
Service Industry Accounting	209.
DAC	
Dac-Easy Light	42.
Intuit	
Quicken 1.5	36.
Layred, Inc.	
at Once!	289.
MECA	
Managing Your Money	124.
Monogram	
Business Sense	269.
Dollars and Sense	81.

Casino Master (Centron)

Become a Master of Casino Gambling! Five separate casino games include **Blackjack Ace**, **Crapsmaster**, **Roulette Master**, **Pokermaster**, and **Baccarat Master**. Exact table simulation, mouse controlled betting, selectable bankroll, stored win/lose statistics and complete manual included. Now available in dazzling color in the Mac II version! Recommended and used by professional gamblers! (entertainment) Buy individual games for \$27, each or get the 5 game Casino Master Package for \$49, or the Deluxe Mac II color version for \$55.

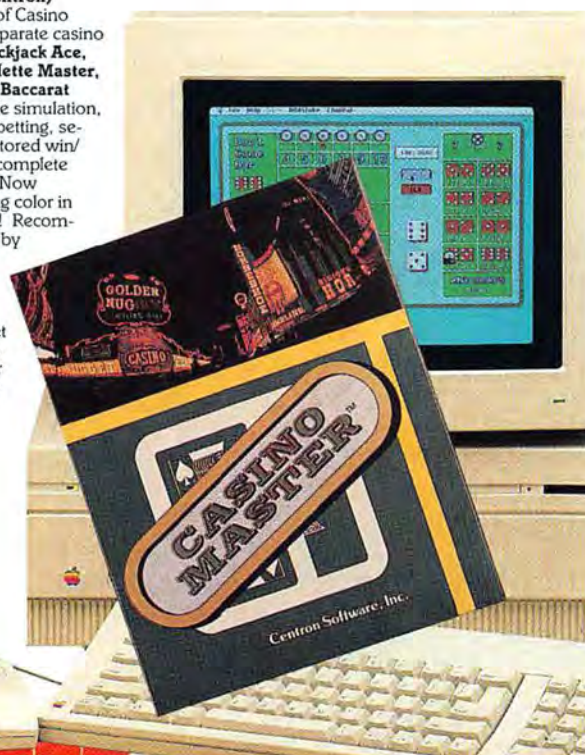
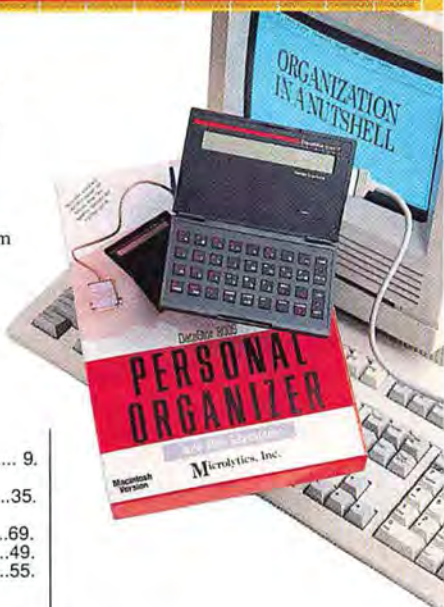
Nolo Press

For The Record	29.
WillMaker	32.
Reality Technologies	
WealthBuilder	165.
ShopKeeper Software	
Bill-It 2.0	99.
Softview	
MacInTax 89	69.
Taxview 1040	309.
Survivor	
MacMoney 3.5	60.

BLANK MEDIA

B.A.S.F. made in U.S.A

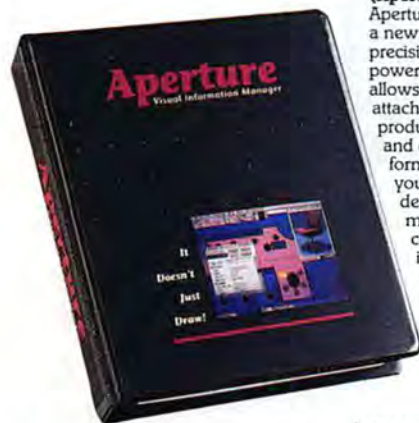
DS/DD (box of 10)	15.
DS/High Density (1.44 Meg)	29.
Peripheral Land, Inc.	
Turbo 40 Cartridge	115.
Sony	
DS/DD (box of 10)	14.



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Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.

OVERNIGHT DELIVERY ONLY \$3.00



Visual Information Manager (Aperture Technologies)

Aperture moves Macintosh graphics into a new dimension by integrating a precision drawing system with a powerful database manager. Aperture allows you to create detailed drawings, attach data to objects in your drawings, produce reports, link drawings together, and display data on your drawings to form complete applications. Whether you are an architect, engineer, designer, space planner, facilities manager, or someone who needs to communicate complex ideas and information, Aperture will become your program of choice. (business) \$729.

Spectrum HoloByte

Falcon 2.0	31.
Tetris color version	24.
Springboard	
Hidden Agenda	36.



Casady & Greene

Vivid Impressions Vol. 1	67.
Claris	
MacDraw II	295.
MacPaint 2.0	99.
Cricket (Computer Associates)	
Cricket Color Paint	179.
Cricket Draw	139.
Deneba	
Canvas 2.0	169.
Dream Maker	
Cliptures, Business Images	69.
MacGallery	27.
Electronic Arts	
Studio/1	97.
Studio/8	299.
Innovative Data Design	
Dreams	269.
MacroMind	
MacroMind Accelerator	149.
MacroMind Director	449.
VideoWorks II	175.
Metro ImageBase (Full Line Available)	
Art Deco or ReportMaker	ea. 76.
Newsletter Maker or Business	ea. 76.
Mindscape	
ZING	139.

ThunderScan (Thunderware)

ThunderScan turns any printed image into a detailed, high resolution Macintosh graphic that you can change and

enhance with ThunderScan's powerful set of software tools. Print out your finished work on your ImageWriter or use ThunderScan's special PostScript printing effects on your LaserWriter. Rotation, framing, captioning, shaping, and other special effects let ThunderScan tap the full resolution of the LaserWriter, producing exquisite true gray scale graphics with up to 300 dots per inch and 32 shades of gray. For use with Mac 512KE, Plus and SE. (A separate power accessory must be purchased for the Mac II) (hardware) \$187.

Multi Ad Services

ProArt: Bus., Sports or Holidays	ea. 95.
Paracomp	
ModelShop	399.
Swivel 3D	325.
Select Micro Systems	
MapMaker 4.0	245.
Silicon Beach	
Digital Darkroom	249.
Super 3D 2.0	319.
SuperPaint 2.0	128.
SuperMac	
PixelPaint 2.0	229.
PixelPaint Professional	399.
Tactic Software	
Art Clips	51.
SoundClips	49.
Zedcor	
Deskpaint 2.0	65.

HARDWARE AND PERIPHERALS

Cutting Edge	
Two Page Monochrome Monitor	999.
DEST	
Dest PC Scan Plus	SPECIAL 699.
General Computing Company	
WriteMove Ink Jet Printer	585.
Magnavox	
Color Monitor 14"	535.
Microlytics	
DataStar-8000 Personal Organizer	65.
Microtek	
Microtek MSF-300GS Scanner	1589.
Mobius	
Multiscreen Video Card w/Princeton 15" monitor	529.
Qume	
Crystal Print Publisher	3445.
Seikosha America	
Seikosha Printer (dot-matrix)	235.

ResumExpert

Quick and easy resume composition. Effective for students to CEO's. 42 MS Word or Works fully-formatted resume templates. Highlight text and replace with your information. Manual identifies 30 special career situations; provides useful resume-writing tips. Four mice Rating. Cover letter editions available. (business) \$39.



Publish-It!

Complete self-contained Desktop Publishing program. Allows both professional & non-professional business communicators to write, design, and produce dynamic, sophisticated documents. From simple in-house newsletters & business forms to full-length magazines and distinctive annual reports; do it faster and easier than before! (desktop publishing) \$239.



Fanny Mac QT

Keep your Mac running cool. If you've upgraded your Mac with extra memory, an internal hard disk drive, a board for a large screen monitor, or an accelerator card, Fanny Mac QT is a required accessory. Pulls 21 cubic feet of air per minute through the computer, includes surge suppressor. (accessories) \$59.

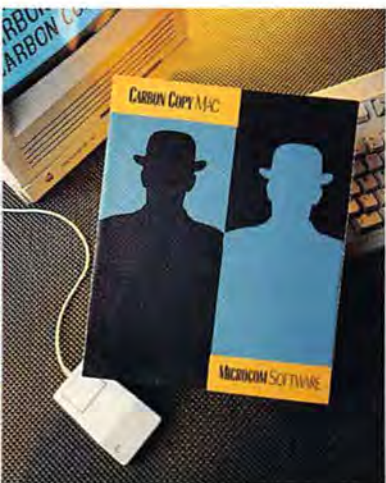


Desktop Help for Excel

For both novices and experts. Puts everything you need to know about Excel in one place — and makes it all available on screen whenever you need it. Just open the Desk Accessory and leave its window open while you work. Upgraded to cover Excel 2.2. (education) \$50.



Bull City Software	
Moriarty's Revenge	36.
Bullseye	
Ferrari Grand Prix or P51	ea. 32.
Fokker Tri-plane	24.
Centron Software, Inc.	
BlackJack or CrapsMaster	ea. 27.
CasinoMaster (5 pack)	49.
Discovery Software	
Arkanoid	26.
Electronic Arts	
Chuck Yeager Adv. Flight Trainer	32.
Miles Computing	
Fool's Errand	32.
Puzzle Gallery	27.
Mindscape	
Balance of Power, Deja Vu	ea. 30.
Hostage	30.
The Colony or Gauntlet	30.
Nemesis	
Go Master	49.
Joseki Tutor	30.
PCAI/XOR	
Lunar Rescue or MacGolf 2.0	34.
MacGolf Classic	53.
Road Racer	39.
NFL Challenge	54.



Carbon Copy Mac (Microcom)

Carbon Copy Mac is a remote control software package for the Macintosh. It allows one Mac to remotely access and operate another Mac's peripherals, screen, keyboard and mouse. Carbon Copy Mac can be used for training, collaborating, file transfer, troubleshooting and updating software. It is the ideal Macintosh network management tool. Carbon Copy Mac can run locally over an Appletalk network or remotely with modems on both machines. (networking) \$119.

The Software Toolworks

ChessMaster 2100	32.
Cribbage & Gin King	39.
Life & Death	32.
The Hunt for Red October	32.

Fonts

Adobe	
Adobe Type Manager	57.
ATM Plus Pack	113.
Fonts (full line avail.)	Call.
Forms and Schedules	279.
Newsletters	229.
Presentations	279.
Textures, Fills, and Patterns	129.
Altsys	
Fontastic Plus 2.02	52.
The Art Importer 2.0	92.
Letraset	
LetraStudio	275.
LetraFonts (various)	ea. 69.
Orange Micro	
Alphabits	69.
Tactic Software	
ArtFonts Vol.1 or 2	55.

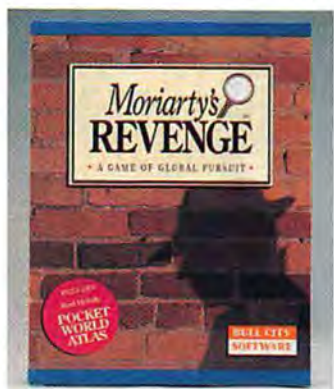
GRAPHICS AND DESIGN

3G Graphics	
Images w/Impact	
Graphics & Symbols 1	52.
Business 1	65.
Adobe	
Illustrator 88 1.8	279.
Streamline	229.
Aegis Development, Inc.	
Showcase F/X	199.
Aldus	
Freehand 2.0	345.
Broderbund	
Drawing Table	75.
TypeStyler	129.

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BUSINESS AND PRESENTATION

A Lasting Impression	
ResumExpert (word vers.)	39.
Adobe Systems, Inc.	
TrueForm SetUp	225.
AEC Management Systems	
FastTrack Schedule	115.
Aldus	
Persuasion 1.0	369.
Antic Software	
FlexForm Bus.Temp Vol 1 or 2 ...ea.	49.
Aperture Technologies	
Aperture Visual Information Mgr. ...	729.
Ashton-Tate	
Full Impact	249.
Avery	
List & Mail	79.
Claris	
MacProject II	379.
SmartForm Designer w/Assistant ...	299.
Cognition Technology	
MacSMARTS PRO	249.
Cricket (Computer Associates)	
Cricket Graph 1.3	115.
Cricket Presents	285.
HyperPress Publishing	
Intelligent Developer	219.
Informix	
WinZ	259.
Microsoft	
Excel 2.2 or PowerPoint 2.1 ea.	249.
The Microsoft Office	529.
Works 2.0	185.



Moriarty's Revenge
(Bull City Software)
An intriguing detective game. Track a suspect around the world using clues you uncover in each city. Solve a case correctly linking the suspect to one of ten diabolical worldwide gangs. Cases increase in difficulty as a player rises in rank. A "Master Sleuth" must track down gang leaders, including the famous Moriarty. (entertainment) \$36.

Portfolio Systems	
Dynodex-Instant Address Book	89.
Power Up	
Address Book Plus	53.
Address Book Plus w/Binder	99.
Calendar Creator	38.
FastForms!	89.
Preferred Publishers	
Direct Mail	54.
ProPlus	
Wall Street Investor	449.
Satori	
Bulk Mailer 3.2.3	78.
Softstream International	
Endeavor Planner	99.
Symantec	
More II 2.01	249.
Symmetry	
KeyPlan	339.
Synex	
MacEnvelope 4.1	65.
MacEnvelope Plus	149.
Vertical Solutions	
FastLabel	49.

Multi-Screen Full Size Display (Mobius)

Expand your vision with a 14 inch monitor. The Display combines a Princeton Graphics 14-inch monitor with the MultiScreen Video Card. Just slide the interface card into your Mac SE and connect it to the Princeton monitor. Enjoy the benefits of a larger screen that can display the full width of a letter-sized page, and over half its length. The software allows you to use your present SE screen in



conjunction with your new larger one. You can optimize the display for either 72 or 85 dpi resolution. (hardware) \$529.

CAD/CAE

Claris	
ClarisCAD	599.
Generic Software	
Generic CADD Level 1	85.
Graphsoft	
Blueprint	349.
MiniCad+2.0	519.
Innovative Data Design	
MacDraft	144.
Dreams	269.
I.S.I.	
Precision	199.
Strata	
StrataVision 3D	375.

COMMUNICATIONS

CE Software	
In/Out (1 to 5 Users)	129.
QuickMail 2.0 (1-10 Users)	249.
CompuServe	
CompuServe Navigator 3.0	45.
CompuServe Subscription Kit	9.95
DataVIZ	
MacLink Plus w/Cable 4.1	125.
MacLink Plus/Translators 4.1	99.
Dow Jones	
News/Retrieval Membership	24.
FreeSoft	
Red Ryder 10.3	52.
Hayes	
Smartcom II 3.1	87.
Infosphere	
Liaison	175.
InSignia Solutions	
Soft PC (Mac II)	245.
MetaComet	
AccuWeather Forecaster	58.
Prodigy	
Mac Starter Kit	30.

Prometheus	
Acknowledge	289.
MacKNOWLEDGE	149.
Software Ventures	
Microphone II v.3.0	219.
Traveling Software	
Lap-Link	81.

DATABASE SOFTWARE

Aclis	
4th Dimension 2.0	469.
AEC Management Systems	
AEC Information Manager	409.
Blyth	
Omnis 5	369.
Claris	
FileMaker II	225.
Fox Software	
FoxBASE+/Mac	295.
Microsoft	
File 2.0	125.
Odesta	
Double Helix III	349.
GeoQuery	199.
ProVUE	
Panorama	205.

DESK ACCESSORIES

Casady & Greene	
QuickDEX	31.
JAM Software	
Smart Alarms & Appt. Diary	49.
Smart Alarms (1 - 4 users)	99.
Smart Alarms (5 - 8 users)	149.
Smart Alarms (9 - 16 users)	199.
Preferred Publishers	
Database	72.
Vantage	55.
Solutions	
SmartScrap & The Clipper 2.0	45.

Cribbage and Gin King

With Cribbage King, you can play against seven personalities, each with unique playing styles, in two-, four-, or five-handed games. Gin King's sophisticated algorithms also challenge your skill with seven AI opponents. Full-color, high resolution graphics, and the traditional Bicycle design add realism to both. (entertainment) \$39.



Hostage

Special Alert: Terrorists have invaded your Embassy and seized an undetermined number of hostages. Lives hang in the balance as high-ranking diplomats are held at gunpoint. Their safety requires immediate action. Prepare to infiltrate the Embassy, neutralize the terrorists, and rescue the hostages. (entertainment) \$30.



P51 Mustang Flight Simulator

Fly the P51-Cadillac of the sky. An incredible adventure in the skies over England and France in WWII. You'll dogfight ME109's, strike ground targets - even buzz the Eiffel Tower. Just like the movies. Fly against another Mac via modem. View action replay from 13 different angles. (entertainment) \$32.



Gauntlet

One of the most successful arcade games of all time has come home. It brings with it all the characters, dungeons, traps, treasures, and excitement you love in the arcades! Thor, Thyra, Questor, and Merlin are together again. Action, sound and animation on your home screen. (entertainment) \$30.



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- Your credit card will not be charged until your order is shipped.
- If we must ship a partial order, we pay the freight on the remaining portion.
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- All products are covered by a 120 day limited warranty.*
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- All orders add \$3.00 per order. We ship Airborne Express overnight unless UPS Ground delivers overnight. (Some rural areas require an extra day.)
- Orders placed by 12:00 Midnight (EST) (weekdays) for "in stock" items ship same day (barring system failure, etc.) for overnight delivery.
- C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS Ground). Charge is \$6 including shipping.
- Alaska, Hawaii, outside continental U.S., APO/FPO call 201-367-0440 for information.

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The Puzzle Storybook

Zug the Megasaurus is back with The Puzzle Storybook for children ages 3-8. Children create pictures, solve puzzles and write stories to combine language arts activities with geometric shapes to build early reading and writing skills. (education) \$27.



Managing Your Money

A fully integrated software program addressing every aspect of personal and small business finance. Write and print checks, set up a personal budget, estimate your taxes and more. (finance) \$124.



Dow Jones News/Retrieval

Dow Jones News/Retrieval membership package comes with E-Z Online communications software, provides the new user with 5 hours of free online time. Connects with more than 50 databases, up-to-the-minute news and financial data, plus extensive reference library. (communications) \$24.



MacKNOWLEDGE

MacKNOWLEDGE is the latest communications software available for your Macintosh. Icon based scripts provide instant access to all major online services with just the click of your mouse. The TAL scripting language provides all the capabilities for customizing and automating your own online sessions or the record function will watch your session and create an icon based script automatically. Also provides support of 9600 bps and MNP modems. (communications) \$149.

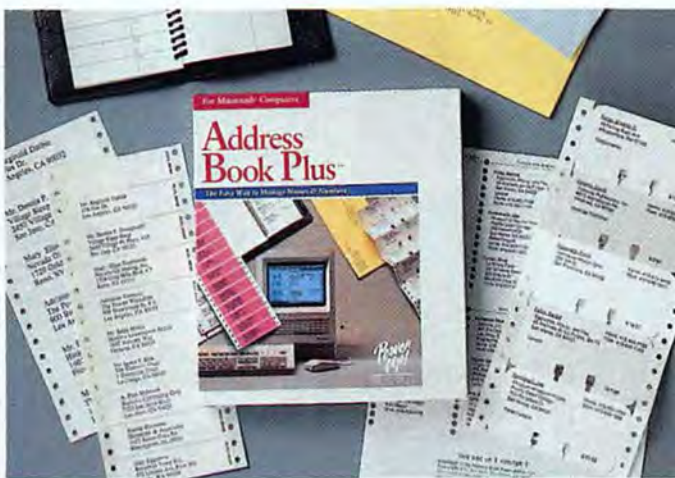
DESKTOP PUBLISHING

Aapps	
MicroTV	289.
Aldus	
PageMaker 3.02	385.
PageMaker Color Extension	179.
Broderbund	
DTP Advisor	47.
Data Translation	
PhotoMac	609.
Emerald City Software	
Smart Art I, II, or III	ea. 85.
Icom Simulations	
MacKern	119.
Letraset	
ColorStudio or FontStudio	Call.
ImageStudio	275.
Ready, Set, Go!	275.
Olduvai	
Plus 1.1	115.
Read-It! 2.1 (OCR)	249.
Read-It! Personal	99.
Read-It! TS (Thunderscan)	79.

Exposure (Preferred Publishers)

Integrated CDEV screen graphics utility for screen capture, painting and formatting of color and gray scale images. Unique format includes built in painting tools and fonts. (utilities) \$54.

Direct Mail
Complete correspondence solution for labels, envelopes, addresses, form letters and telephone dialing. Easily searches, sorts, and mails address files for select mailing, merging or exporting. Available as DA or application. (business) \$54.



Address Book Plus / Address Book Plus with Binder (Power Up!)

Address Book Plus is the most complete and ready-to-use solution for managing names, addresses, phone numbers and other vital information. Users can input, edit and view business and personal contact information, and print it out in a

variety of readily-usable forms including address book pages, rotary-file or index cards, phone list, mailing labels, and envelopes. It also provides searching and automatic dialing capability in a separate Desk Accessory. (business) **Address Book Plus \$53 or Address Book Plus w/ Binder \$99.**

Quark

QuarkStyle	175.
Xpress	479.
Springboard	
Springboard Publisher II	109.
TimeWorks	
Publish-It!	239.

DISK DRIVES/BOARDS

Aristotle Industries, Inc.	
HardPac Mac 20 Meg	479.
HardPac Mac 40 Meg	755.
HardPac Mac 80 Meg	1099.
HardPac Mac 105 Meg	1235.
CMS	
MacStack 20 Meg	529.
MacStack 30 Meg	545.
MacStack 45 Meg	625.
MacStack 60 Meg	699.
MacStack 80 Meg	799.
Cutting Edge	
800K External Floppy Drive	149.
SyQuest Removable 45 Meg	899.
Under the Mac 20 Meg	439.
Under the Mac 30+ Meg	499.
Under the Mac 45+ Meg	549.
Under the Mac 65+ Meg	629.
Under the Mac 80+ Meg	739.
Dayna Communications	
Dayna File Single 360K (5 1/4")	529.
Dayna File Dual 360K & 1.44M	729.
Dolphin Systems Tech	
Integra 20 Meg	499.
Integra 30 Meg	595.

Integra 40 Meg	719.
Integra 60 Meg	778.
Integra 80 Meg	995.
Flipper 150 Meg Tape Backup	1439.
Kennet Technology	
Drive 2.4	359.
Rapport	219.
PCPC	
MacBottom Hard Drives	Call.
Peripheral Land, Inc.	
Infinity Turbo 40 Meg	1119.
Turbo Floppy 1.4	359.
Quantum	
Quantum 40 MB Raw Drive	525.
Quantum 80 MB Raw Drive	869.
RasterOps	
RasterOps Colorboard 264	760.

WealthBuilder (Reality Technologies)

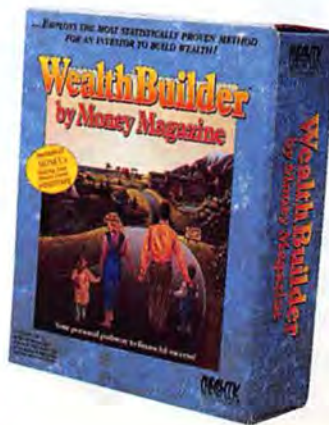
Turn your Mac into your own financial planner. Taking into account your financial profile, the goals that you want to accomplish and the risk that you are willing to assume, WealthBuilder searches for the best investments available to fulfill your objectives. The program also allows you to change any information or assumption and immediately view its impact on your overall financial picture. WealthBuilder is your personal tool to a brighter financial future. (finance) \$165.

EDUCATIONAL/PERSONAL

Bootware Software	
ResumeWriter Pro	58.
BrightStar	
Alphabet Blocks 3.01	30.
Talking Tiles	27.
Davidson	
Math Blaster	27.
Speed Reader II	27.
First Byte	
The Dinosaur Discovery Kit	27.
The Puzzle Storybook	27.
The Rhyming Notebook	27.
Fair Tide Technologies	
Navigate! mono	199.
Help Software, Inc.	
Desktop Help for Excel	50.
Learning Company	
Reader Rabbit or Math Rabbit	31.
MicroTech	
Elementary Signer	49.
Finger Speller	29.
The Software Toolworks	
Mavis Beacon Teaches Typing	32.
Visionary Software	
Synchronicity	39.
Voice & Video Instruction Videos	
HyperCard or Pagemaker 3.0	ea. 35.
Word 4.0 Video Tape	35.

ENTERTAINMENT

Access Software, Inc.	
World Class Leader Board	27.
Artworx	
Bridge 6.0	24.
Daily Double Horse Racing	19.
GrailQuest	19.
Broderbund	
Ancient Art of War At Sea	27.
Shufflepuck Cafe	24.
Where in the World is Carmen	27.



MIDNIGHT EXPRESS

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Believe it or not, between now and December 22nd, you can place your order with MacWarehouse anytime up to 12:00 midnight (E), and still have your package delivered not long after the morning paper! All for our amazingly low \$3 overnight delivery charge!

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Sharp

The Wizard 249.

ThunderWare

LightningScan 369.

ThunderScan 5.0 187.

HYPERWARE

Activision

Focal Point II 117.

Reports for HyperCard 69.

Bantam

Complete HyperCard Handbook 22.

Beacon Technologies

HyperBible International Version ... 175.

HyperBible King James Version 145.

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BrainPower

ArchText 199.

Bright Star Technology

HyperAnimator 1.5.1 99.

interFACE 250.

DataDesk International

HyperDialer 29.

ICOM Simulations

HyperTMON 59.

MicroMaps

HyperAtlas 59.

Power Up

HyperTutor 29.

Silicon Beach

SuperCard 128.

Softstream International

HyperHit 125.

Springboard

Family Matters 28.

Symmetry

HyperDA 1.2 49.

TimeWorks

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DataDesk Intl.

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Koala

MacVision 2.0 219.

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MacSnap 524S 239.

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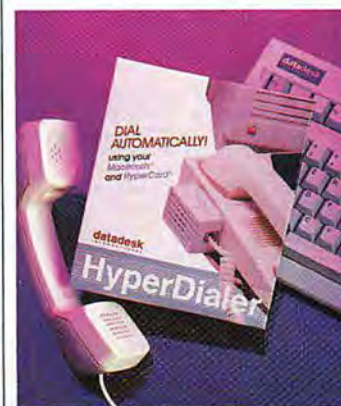
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US Robotics	
Courier 9600 Modem	689.

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Resonance	
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Dove	
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Timbuktu Remote 1.0.1	129.
TrafficWatch	132.
PhoneNET PLUS	33.
PhoneNET Repeater	319.
PhoneNET Star Controller	1095.
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Carbon Copy Mac	119.
Shiva	
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TOPS	
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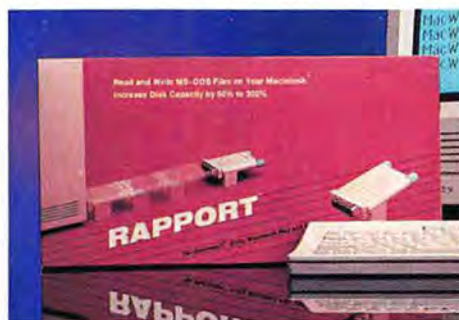
Drive 2.4 (Kennet Technology)
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Mainstay	
AntiToxin	59.
Symantec Corporation	
S. A. M.	63.

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Spelling Coach Pro	115.



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Thunder II	52.
Expertise	
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Microlytics	
Electronic Word Finder	75.
Word Finder 2.0	36.
Sensible Software	
BookEnds or Sensible Grammar	53.

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ALSoft	
DiskExpress II	Call.
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MultiDisk	49.
Master Juggler	64.
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Stepping Out II	50.
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QuickKeys 1.2	65.
Caere	
OmniPage	555.
Central Point Software	
Copy II Mac (with MacTools)	24.
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Retrospect	155.
Emerald City Software	
Lasertalk 1.0	149.
Fifth Generation	
DiskLock	108.
FastBack II	107.
PowerStation 2.5	34.
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Suitcase II	45.
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MacTree Plus	46.
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On Cue	35.
Insight Development	
MacPrint	79.
Magic Software	
AutoSave II	29.
BackMatic	50.
POWERIcons or POWERmenus ea.	39.
Mainstay	
Capture 2.0	49.
Microlytics	
GOfer	47.
Olduvai	
ClipShare	139.
MultiClip	51.



PCPC	
HFS Backup 3.0	54.
Peripheral Land, Inc.	
TurboBack	55.
TurboCache or Turbo Spool	ea. 73.
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Free up space on your desktop by raising your printer four inches. Store extra toner cartridges or supplies conveniently underneath. Attractive 2-piece steel construction fits any size printer. **\$28**.

Large Screen Monitor Stand raises your monitor four inches for easier viewing, allows you to store your keyboard and other supplies underneath. **\$39**.

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800K Drive

The Cutting Edge 800K drive's attractive styling, quiet performance, and high-tech reliability make it our most popular floppy drive. Features an LED light to indicate disk access and a hinged door over the disk insertion slot to keep the mechanism clean. One year manufacturer's warranty. (disk drives) **\$149**.



Two Page Monochrome Monitor (Cutting Edge)

Every Mac SE and II user can now justify the expense of a big screen with the new Cutting Edge 19" Two Page Monochrome Display System. The Cutting Edge Monitor includes the interface card and matches just about all the features of other big screen display systems costing twice as much. It has a flicker-free refresh rate of 70 hertz and a high resolution of 72 DPL. Like all Cutting Edge products it comes with a one year warranty and a 30 day money back guarantee. (hardware) **\$999**.



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In Good Form

complicated the form and the bigger the stack, the slower the program runs. I preferred TrueForm for filling in data. It ran faster for comparable tasks, and the instructions and choice lists were nicely handled. TrueForm is also the only program that smoothly imports complex information from a text file into a form's various fields.

The real power in these forms-management programs resides in the fill-out stage.


Printing in SmartForm and TrueForm is simple. You can print both the data and the image of the form or just the data if you want to output onto preprinted forms. You can customize the print area to a particular size of paper as well. In SmartForm you can print a part number (customer copy, store copy, and so on) on each respective page for multiple copies of a form. SmartForm also lets you shrink data to fit within a box. TrueForm lets you reverse the printing order.

Printing is slow with any of these programs. Fast Forms lives up to its name by being quicker than SmartForm or TrueForm. TrueForm is optimized for printing scanned images, thus sacrificing printing speed for PICT and EPSF images.

The Database and E-Mail Connection

Forms-management programs occupy a middle ground between graphics and page-layout programs on the one hand and database managers on the other. They address one need of computerized data collection — making the forms' on-line interface look similar to what you're used to — without going the whole distance to database management. But the future of forms management

is clearly tied to databases (see the "Forms and Database Management" sidebar): The more data you collect, the more you have to manage. Since the kilobyte overhead of a classy interface is high, you may not see forms managers as front ends to databases until 2 or 4 megabytes of RAM become common on most systems. (You're less likely to see database capabilities built into forms packages themselves.) Only TrueForm presently links up with a database program (4th Dimension).

The most intriguing future use of forms packages may be their tie-in to electronic-mail systems. (Both QuickMail and Microsoft Mail have rudimentary forms makers.) The store-and-forward engine of E-mail would let you route forms intelligently over a network, earmarked to follow a bureaucratic chain of people to sign off on the form, or to automate electronic invoicing. With features such as this, forms-management packages could bring us one step closer to the elusive dream of the paperless office. 

Ben Templin is the former editor-in-chief of MacGuide magazine. He keeps in good form by running daily. One look at his desk tells you that he does not believe in the paperless office.

A Few Good Forms

If design isn't your forte, consider buying prepackaged forms. These packages contain commonly used business forms that you can print out and, in some cases, use in fill-out applications.

FlexForm Business Templates, Volumes I and II 1/2

This package comes with a copy of SmartForm Assistant. Volume 1 contains stockkeeping, production, sales, delivery, billing, and collection forms. Volume 2 has purchasing, receiving, accounting, disbursing, and personnel forms. Many of these forms are also available in PageMaker format. You can customize and print them for office use.

\$89.95 per volume. Antic Software, 544 Second St., San Francisco, CA 94107; (415) 957-0886.

FormSet

FormSet, from SoftView, the maker of MacInTax, is a collection of 65 forms — including job estimates, earning statements, credit memos, and time cards — that can be customized with company names and logos. This fill-out program has the usual features: date stamping, field calculation, etc. \$99. SoftView, Inc., 1721 Pacific Ave., Suite 100, Oxnard, CA 93033; (805) 385-5000.

The Bottom Line

SmartForm and TrueForm run neck and neck, while Fast Forms is a distant third. MacUser rated Fast Forms at five mice in November 1987. Back then it was the top program available. But it hasn't undergone any major changes, and other packages with better features have appeared. Thus, it is now downgraded to three mice.

That leaves TrueForm and SmartForm. For top honors, these two programs cancel one another out more for what they don't have than for what they do.

SmartForm is the easier package to use. A robust program that handles many different tasks competently, with a minimum of programming effort, it has everything you need except database capability. TrueForm links up with a database but has no design environment.

From a design perspective, if you have preexisting paper forms that you want translated onto the computer, TrueForm is your best choice. But if you want to start from scratch, or if you think you'll revise your forms often, choose SmartForm. From a management perspective, TrueForm has a lot more potential because of its database links.

Since I'm forced to use either a forms program that has no design capability but has a database connection or one with design capability and no database, I'd sacrifice the design capability and choose TrueForm. Like many other users, I already have a page-layout program that suits me well for forms design. Because most of my time is spent filling out, rather than designing, forms, I want the slight edge that TrueForm offers in management tasks.

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Table 1: Features

	Fast Forms	TrueForm	SmartForm
Design			
Drawing environment	✓		✓
Scanning within program		✓	
Import (file formats supported)			
Paint		✓	
PICT		✓	✓
TIFF		✓	
EPSF		✓	✓
Field alignment		✓	✓
Font/style formatting	✓	✓	✓
Check boxes	✓	✓	✓
Field-sequence change	✓	✓	✓
Magnification	✓		✓
Fill out			
DA	✓		
Date	✓	✓	✓
Counters			✓
Lists		✓	✓
Help messages		✓	✓
Calculation fields	✓	✓	✓
Formulas		✓	✓
Logical operators	✓	✓	✓
Password		✓	
Print data only		✓	✓
Custom print sizes	✓	✓	✓
Forms management			
Import capability		✓	
Database link		✓	
Export	✓	✓	✓
Form collection in stack		✓	✓
Find command		✓	✓
Logical operators		✓	✓

Report Cards

Fast Forms 1.2.1



Once the premier forms-management program, Fast Forms is showing its age. It has only basic calculation ability and a limited design environment.

Pros: Uses a DA to fill out forms. This approach is helpful for users who want to run an accounting or database program concurrently and don't have enough memory to run MultiFinder.

Cons: The interface is confusing and does not follow Apple guidelines for basics such as scroll bars.

Requires: Mac 512KE or later, System 3.2 or later, and Finder 5.3 or later.

List Price: \$149.95

Power Up! Software Corp., 2929 Campus Drive, San Mateo, CA 94403; (415) 345-5900.

SmartForm 1.1



A full-featured design-and-management program that caters to the administrator in all of us. The only forms-design package that imports color graphics.

Pros: Easy-to-use design environment makes creating forms a cinch.

Cons: Performs extremely slowly when filling out forms. It's easy to get ahead of the program. It lacks database links.

Requires: 1 megabyte of RAM and two floppy-disk drives or a hard-disk drive.

List Price: SmartForm Designer with a single-use copy of SmartForm Assistant, \$399; additional copies of Assistant, \$49 each or \$399 per ten-pack.

Clarix Corp., 5201 Patrick Henry Drive, Santa Clara, CA 95052-8168; (408) 987-7000.

TrueForm 2.0



Creates an electronic form by scanning a preexisting paper one or importing files from another design environment. The only forms package with a database link.

Pros: Database link with 4th Dimension makes it, potentially, the most powerful forms-management system available.

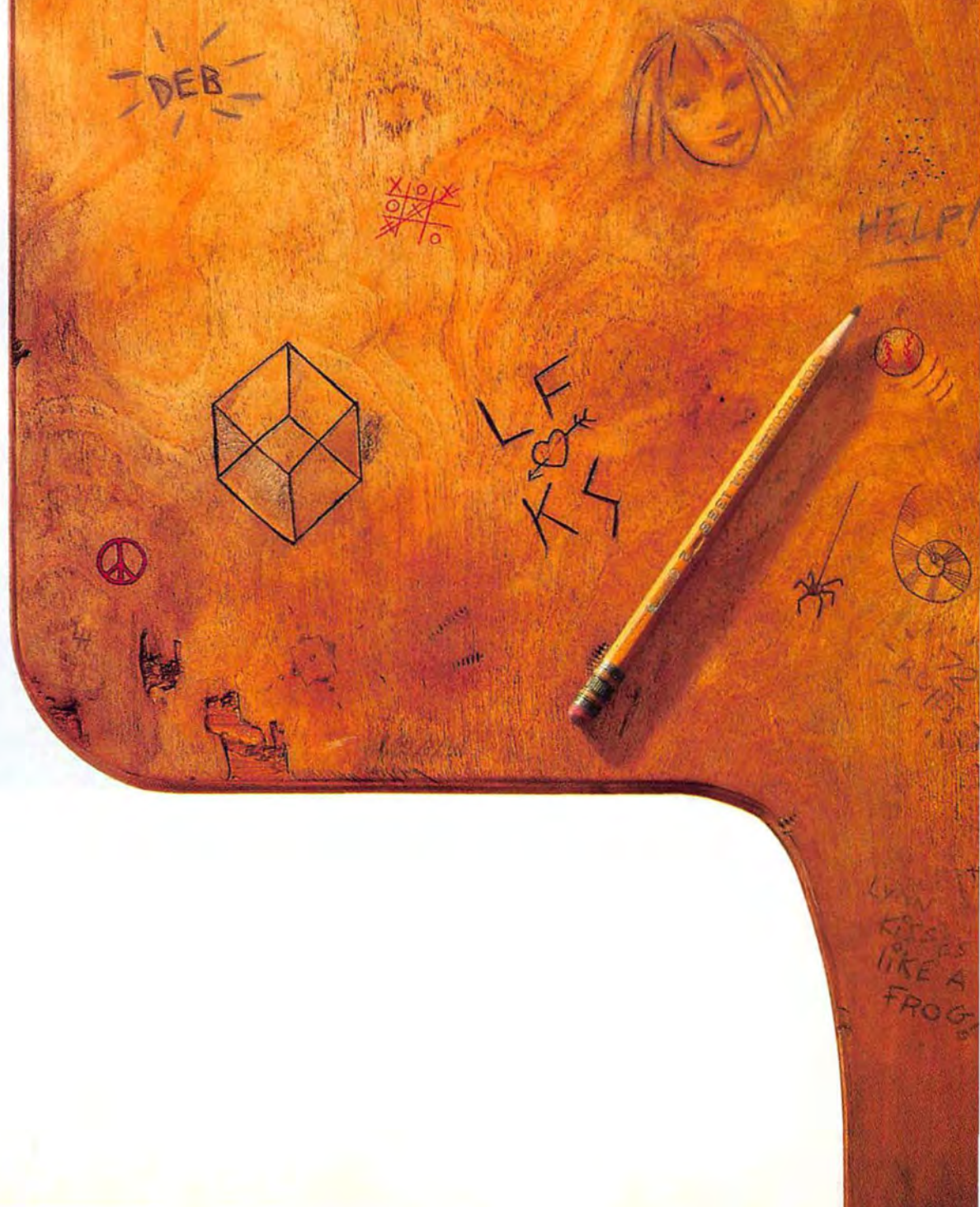
Cons: Lacks a design environment.

Requires: 1 megabyte of RAM and second floppy-disk drive or hard-disk drive, System 6.0 or later.

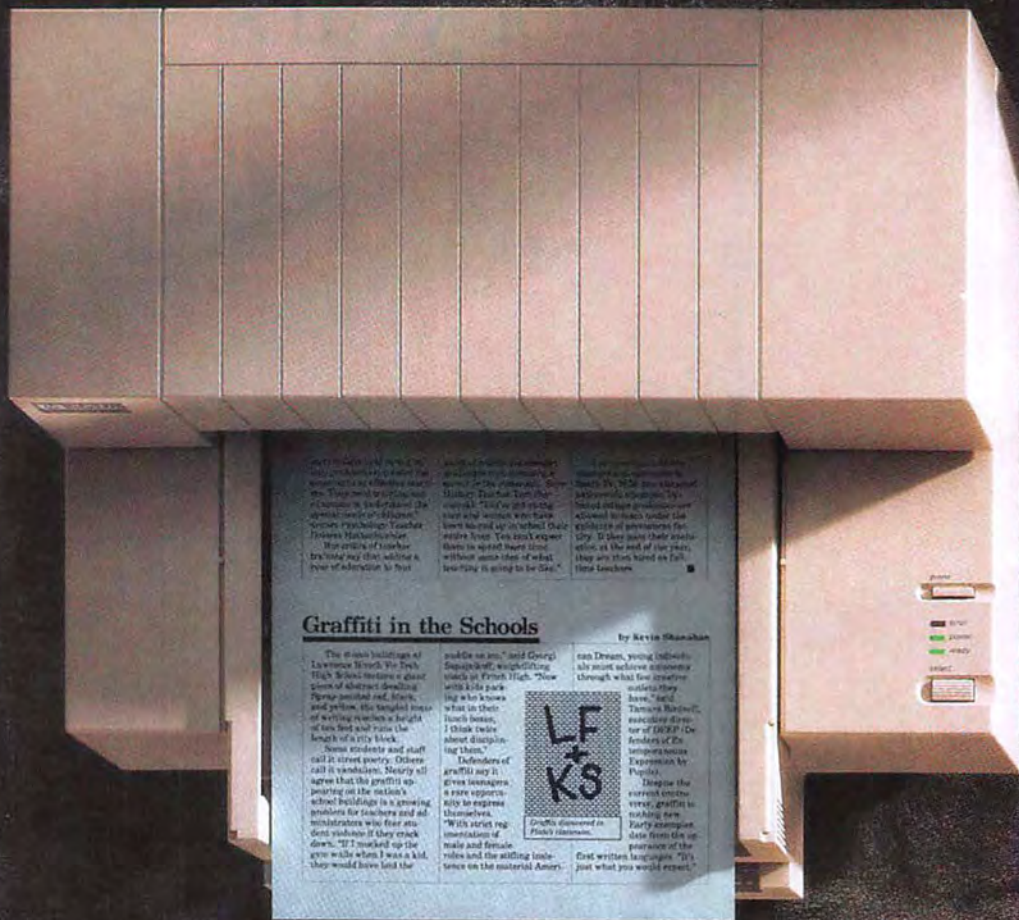
List Price: TrueForm Set-Up and TrueForm Fill-Out, \$395; Fill-Out four-pack, \$295.

Adobe Systems Corp., 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900; (415) 961-4400.

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Graffiti in the Schools

by Kevin Shanahan

The stone buildings of Lawrence North High School feature a cloud of abstract graffiti. The graffiti is in red, black, and yellow, and is a mix of writing and images. Some students and staff call it street poetry. Others call it vandalism. Nearly all agree that the graffiti is a problem for teachers and administrators who fear students will be distracted if they crack down. "If I cracked up the gym walls when I was a kid, they would have said the

kids were on drugs," said George Supakoff, superintendent of Lawrence North. "Now we have kids who know what to do in their lunch boxes. I think we're about disciplining them." Defenders of graffiti say it gives teenagers a rare opportunity to express themselves. "With strict regulations of male and female roles and the sitting importance on the material Amer-

ican Dream, young individuals must achieve something through what few creative outlets they have," said Thomas Rindell, executive director of LERP (The League of Educational Reformers by Parents). Despite the current craze, graffiti is nothing new. Early examples date from the appearance of the first written languages. "It's just what you would expect,"

LF
KS

Graffiti covered in
Punk's name.

First written languages. "It's just what you would expect."

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Charting a Course

From organization charts to procedures to programming, flowcharts can provide structural maps for the mind. Here are three smart programs that specialize in intelligent flowcharting powers beyond the ability of most draw programs.

By Salvatore Parascandolo

If you've ever mapped out a changing organization chart or interactively described a problem, a program, or a prognosis, you might have wondered if you could use a flowchart program. After all, you can use the lowliest drawing application to turn out impressive flowcharts: The standard symbols are easy to draw and save. Some outliners, such as MORE II, also let you construct rigid flowcharts. Typically, though, you can spend eons tweaking and readjusting connections and



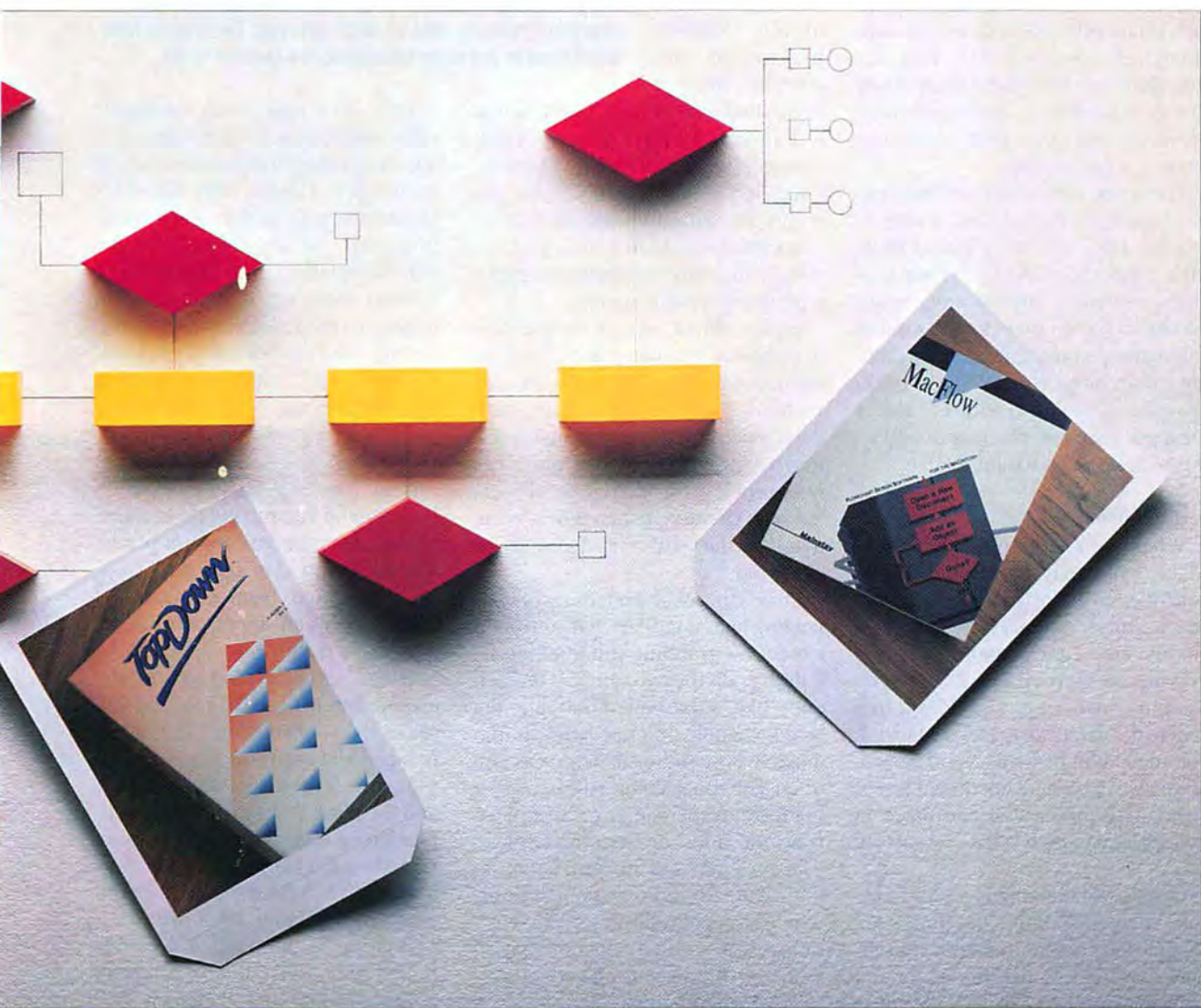
PHOTOGRAPHY: STEVE SPELMAN

lines whenever you change your document. But spend a half hour or so with DiagramMaker, MacFlow 3.0, or TopDown—three good flowcharting programs for the Mac — and you'll see just how easy and efficient flowcharting can be when you use the right tools.

A key feature in all three flowcharting programs reviewed here is their ability to keep objects connected (not just grouped) as you reposition them. Each program does its best to maintain symbol connections with lines that stretch, bend, and adjust as

you shift elements around. What's more, you can state your preference for the type of connectors you want or change one or more connectors after the fact. For example, you might decide to substitute all diagonal lines with right-angled paths, or you might manually route a link through or around some intricate slalom course.

Flowcharting programs do even more. They let you establish and maintain automatic hierarchical links — that is, perform HyperCard-like navigation from a symbol to the complex diagram it represents. With



Charting a Course

MacFlow and TopDown, you double-click to travel to deeper levels; DiagramMaker uses document-to-document links. These programs also keep track of what's linked to what and where each linked item is, so all you need to do is click or issue a command to hop through levels or even documents. Each program's underlying database beats even the spiffiest drawing packages at the flowcharting game.

Another major headache-saver is these programs' ability to replace any number of selected drawn symbols with any selected palette symbol, bypassing the surgical cutting and reconnecting you'd have to endure if you did it manually. Replaced symbols retain prior connections, dimensions, and contained text. This feature alone can have great value if you discover that one of your heavily used symbols isn't quite up to your customer's requirements.

The applications discussed here can be used for charting and program design. They are not intended to be high-powered CASE (computer-aided software engineering) tools, however, nor do they do any kind of calculation, summarization, or complex searching. But all three packages are rich with features. Table 1 presents features not mentioned in this article, so do examine it.

DiagramMaker

When you first open DiagramMaker, you may be stunned by its nearly empty tool palette. This palette is fully editable, however. You simply construct something in the drawing area, group the elements you used to construct it, and drag it to a spot in the palette to create a new tool, complete with its own icon. The program also includes a document full of standard symbols you can place in your palette to give you a custom tool set.

DiagramMaker manages the cursor for you. When it's not drawing a shape, your cursor is either a grabbing hand, a text I-beam, or a point grabber — all based on where it is

within a symbol.

Because the program lacks polygon and free-hand tools, you'll want to make some tools with imported PICT objects drawn with a full-blown graphics program. These foreign PICTs do well, and they can be scaled, but you cannot ungroup and edit them as you can DiagramMaker's native objects. Object-tool icons are formed from a highly reduced version of the actual tool object. A single click on a tool deselects the tool after you've used it once. If you double-click, you can retain the same tool indefinitely. If you Option-click on a tool, you can simply click on the document to make a presized symbol appear.

Every object, except an arc or a line, has a text-entry area with an opaque white background centered within it. DiagramMaker has a tendency to install too large a text block into an imported PICT symbol. It's not a problem for rectangular shapes, but with irregular concoctions, some details at the symbol's edges may be obscured.

DiagramMaker's handling of connecting lines is unlike what you might expect — grabbing a line along its length grabs the two symbols on each end, like a barbell. Grabbing the middle handle of a line bends it into an arc whose radius increases as you drag. Diagonal connections can be made from the center of an object, from the sides, or from the corners. The program has no provisions to maintain 90-degree connections, which really cuts down its efficiency rating for formal documentation work, but the arcs may be your ticket to network nirvana.

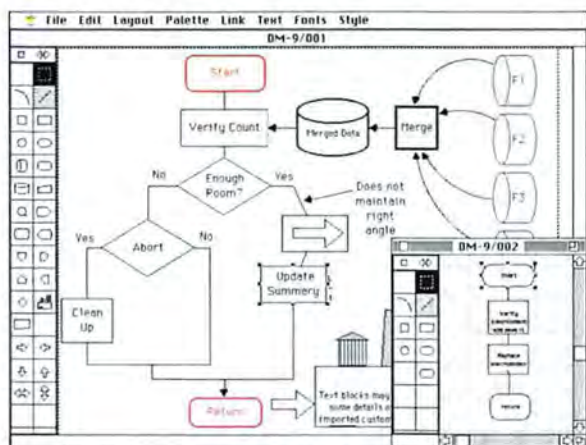


Figure 1: DiagramMaker's lines can be pulled into arcs, and line tips automatically join when they touch. It has no provision for right-angle maintenance. The easily editable palette is also a subassembly library in which you can keep simple or complex structures ready for long- or short-term use. The symbols with active handles, one in each document, are logically linked.

Line ends that touch automatically attach to each other. Lines that attach to one symbol also attach to each other. Unlike with the other flowcharting programs, if a symbol is deleted, the line connections are still maintained, so removing a symbol from the middle of a set maintains the link between the preceding and succeeding objects. These "sticky" lines also form a polygonlike tool with which you can produce a closed but unfillable shape.

You can use DiagramMaker's background layer to create headers, footers, decorations, and templates. The background images can be edited, protected from editing, and hidden and can appear on all the pages of a document.

DiagramMaker also offers the establishment of a *navigational* link rather than a visual one. The link is independent of connecting-line linking. You Shift-select two symbols and then link them with Command-L or a menu selection. Each link can be assigned a name up to four characters long. You traverse a linked chain by selecting any object in it and going to the next or previous linked item. You can also establish a navigational link between two

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Charting a Course

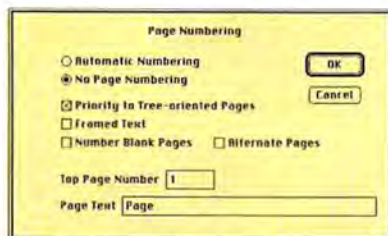


Figure 2: DiagramMaker's Page Numbering and Printing options let you start page numbering where you like, print in a logically linked sequence, and skip blank pages in a large document.

objects in separate documents, which lets you click across documents as if they were parts of a single chart.

Overall, DiagramMaker's document-linking procedure is not as clean as the simple double-click that MacFlow and TopDown use, but the program's links can take you up and down a pile of documents, which may be exactly what you need. When you print your document, you can opt to number the pages according to the order of the logical links rather than to their physical proximity. You can also elect to bypass printing blank pages.

There's *more*, though — that is, DiagramMaker has one of MORE's talents: It can automatically create an organization chart from an indented text list. What's nice is that after it's been created, you can tweak it right there in the program and have automatic link maintenance to boot. If you've ever edited a MORE chart in a draw program, you will appreciate this feature. During such tweaking, you'll sorely feel the program's inability to maintain right-angled connections. But DiagramMaker raises the ante further by including a text-find feature that can locate a specified word or phrase anywhere in the document.

MacFlow

MacFlow has evolved into an elegant tool, having come a few parsecs from its earlier versions. It still has only one cursor, but this changes appearance and function depending on

where you click relative to a symbol. When the cursor is on a symbol's border, it becomes an arrow that lets you resize or reposition the symbol. When it's inside a symbol, the cursor becomes an I-beam text tool. You can click and type with it, or you can drag *beyond* the borders of the symbol, which tells MacFlow you're forming a link. MacFlow draws a connecting line from the starting symbol to wherever you stop your drag.

To create a chart, you drag the symbol you want onto the drawing area. The new symbol emerges already sized, so you don't have to worry about sizing each new addition separately. If you change the size of a specific symbol type, then every time you drag that kind of symbol from the palette, it emerges at the previously set size. You can also select any number and kind of drawn symbols and force them into standard dimensions.

MacFlow allows you to assemble your own object-oriented symbols with embedded text fields. However, you must use a DA or a separate program to make the object, which you can then paste into MacFlow's Symbol Librarian window for customization. The Symbol Librarian lets you specify the number of attachment points on each side of the symbol and also how deep into the symbol they should be. Custom symbols with a rectangular structure generally work the best because their anchor points coincide nicely with their visible borders. The anchor points for irregular symbols may not always touch the symbol borders, but if you limit the number of points

to one per side, you can rig up things so they look perfect. You can easily position and size a text-entry rectangle anywhere inside a custom symbol.

With MacFlow you can have lines that have special nodes at their bending points. You can then run connecting lines to these nodes as if they were tiny symbols. This option is especially useful for structured decision blocks, when several condition paths must merge back into one path at a point where there's no symbol. A well-placed node is invaluable for showing any kind of consolidation or divergence.

Multiple symbols can link to an identical lower-level flowchart. This excellent feature saves you from keeping multiple copies of a lower-level process, any one of which could become outdated. MacFlow's method lets you keep one copy whose changes will always be visible from all links.

MacFlow's connecting philosophy gives you workable and editable charts in much less time than if you were to make them by hand. Your line preferences affect the reconnected outcome when you shift or resize symbols. If your tweaks are within reasonable limits, the updated

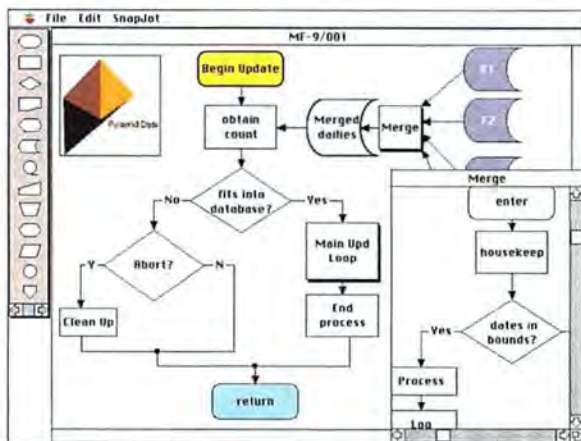


Figure 3: MacFlow's rotating palette holds standard symbols plus your own customized imports. Shadowed symbols take you to charts at deeper levels. The program's controllable line-attachment points, self-maintaining right-angle connections, and multiple parallel connections may be just what you need.

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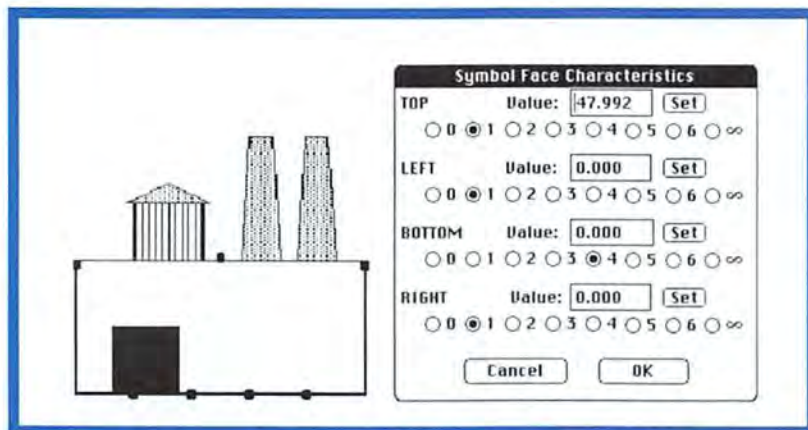


Figure 4: MacFlow's Symbol Librarian lets you import images from paint and draw programs and assign connection attributes and a default size. The dots are legal points for attaching lines.

connections look amazingly good. If you push it past a certain point, however, MacFlow can lose track of things and run lines inside symbols, point arrows from the inside out, and generally convolute a line or two.

Part of the problem is that your connection preferences aren't associated with each individual line. You often want right angles in some parts and pure diagonals in others. If you shift part of your diagram and you're in the wrong mode, you can wreak major havoc that requires manual intervention to repair. You can, however, avoid most problems by examining your current line mode before you make a major position change. To correct small goofs, you can simply drag a connector to the proper face of the symbol.

Finally, MacFlow has the surprising ability to *launch* any application that you've previously associated with a symbol. For example, the launched program can be the executable version of a custom application whose function is described by the flowchart, or it can be a compiler that opens up the source code for a subroutine under development. You can even specify a document to be opened once the application launches. When you quit the launched program, you automatically return to MacFlow, at the precise document symbol you last used.

TopDown

TopDown's forte is its ability to keep your flowchart objects neatly connected with your choice of diagonal or right-angled lines. It does much of the drudgery of rerouting and adjusting for you. You can override the automatic connecting lines manually by adding, moving, and removing vertices and line segments; however, you don't always have control over the location of the anchor points on a symbol, whether you're in manual or automatic-linking mode.

TopDown's handling of right-angled connections is superb. In fact, this seems to be its specialty. Each line can have its own preferred mode: side-then-down, down-then-side, or org-chart-style (a down-side-down connection). But with diagonal lines in manual connection mode, with

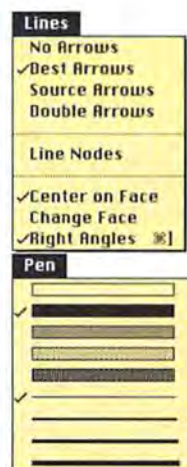


Figure 5: MacFlow's Lines menu lets you select line-connection preferences, and its Pen menu lets you choose line attributes.

few exceptions, the program retains control of the lines' anchor points, which can make a connection seem less well groomed than it should be. Kaetron will be providing the means for users to establish fixed anchor points in future releases of TopDown.

On the other hand, TopDown makes sure that all vertical or horizontal line segments stay that way when you reposition the attached symbols. The same is true for diagonal components of a connection. Whenever a physical relationship forces rerouting of connectors, however, and a connector vertex lands inside an existing symbol, TopDown will intelligently attempt one alternative path. This action won't auto-snake lines through cerebellumlike mazes, but it will save you a lot of cleaning up after you've shifted a

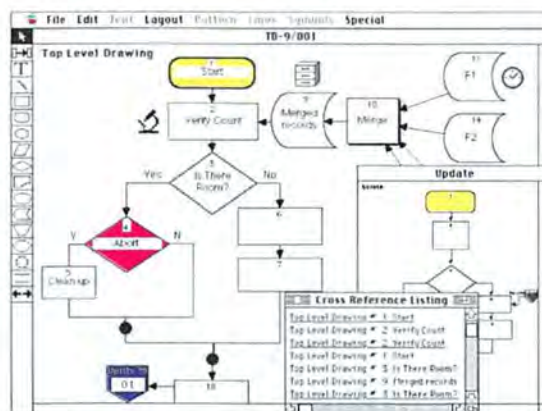


Figure 6: TopDown's right-angle connections are its forte. Each line remembers its preferred style, which helps keep your drawing under control when it reconnects symbols after a shift. Automatic and manual symbol numbering, click-and-go off-page connectors, and chart reports round out this program.


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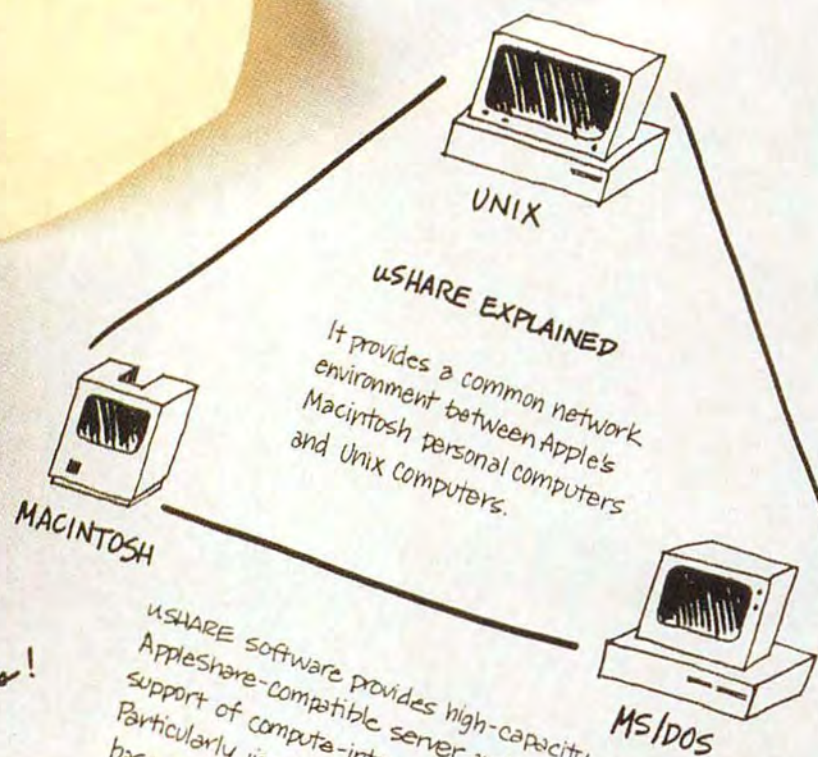
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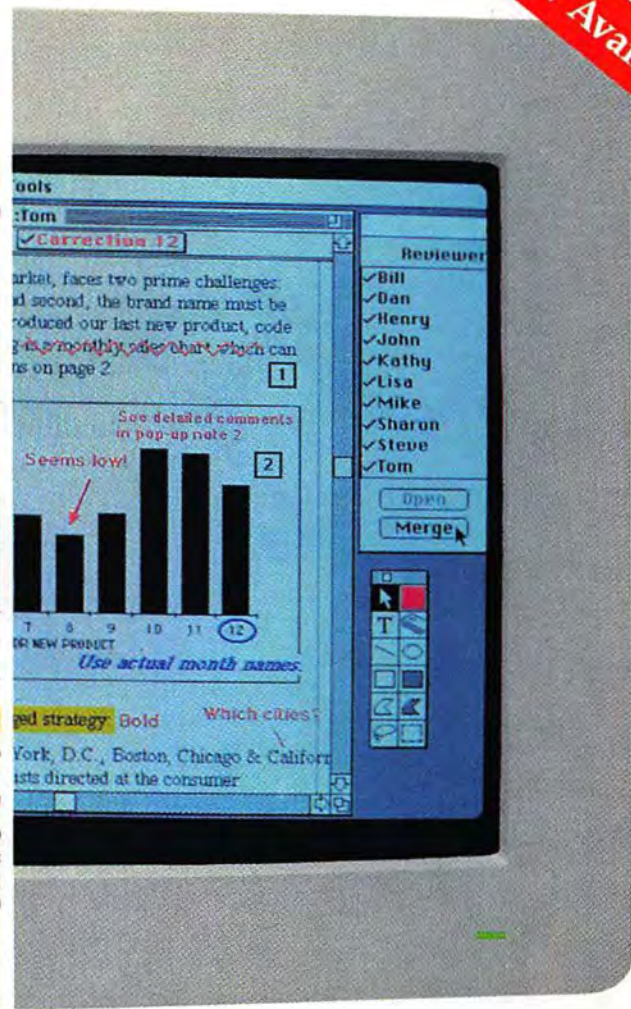
	DiagramMaker 1.1	MacFlow 3.01	TopDown 1.1a
Symbols			
Standard flowcharting-symbol shapes	yes	yes	yes
Hierarchically nest/link diagrams	yes	yes	yes
Substitute one symbol with another	yes	yes	yes
Create new symbols within program	yes, by combining existing shapes	imported art	no *
Make new symbols from imported graphics	yes	yes	yes
Paste in externally prepared graphics	yes	yes	yes
Auto-numbering of symbols	no	no	yes, with manual override
Object-link management			
Automatic right-angle connections	no	yes	yes
Bind text to a connecting line	no	yes	no *
Link multiple symbols to same subchart	no	yes	no
Link symbol to a pop-up note; text capacity	no	yes; 32,000 characters	yes; 32,000 characters
Off-page connectors go to related page	yes	no	yes, on- and off-document
Types of connecting lines	straight, arc, poly	straight, poly, right angle	straight, poly, 3 kinds of right-angles
Location of attaching points on symbols	center, corners, midside	anywhere, grid-based, centered	centered, manual, auto
Connect lines to nodes in other lines	yes	yes	no
Hand-edit connecting lines	yes, vertices, any segment	yes, vertices, anchors, any segment	vertices, anchor points†
Add/remove connecting line segments	yes, needs manual reconnection	yes, auto reconnects	yes, auto reconnects
Manually change anchor points	yes	yes	yes, but auto shifts as needed
Handling of anchor points when objects move	fixed on original point	fixed or optionally changes face	changes face, avoids collisions
Handling of anchor points when objects resize	fixed on original point	centered, spreads multiple points	may change as needed
Object-handling and precision			
Object-alignment options	full & page/drawing centering	full	full
Grid-snap option	yes	yes	yes
Group/ungroup	yes	no	no
Display symbol size	yes	no	yes, in dialog box
Display rulers	no	no	yes
Symbol resizing method	from corner, no proportion help	from center, proportion option	from corner, no proportion help
Select all symbols automatically	no	yes	yes
Select all lines automatically	no	yes	yes
Provide multiple views of same document	no	no	yes, via scrolling panes
Limits			
Maximum number of predefined symbols	depends on monitor size	200	36 oriented, 24 bit maps
Maximum number of symbols per document	RAM-limited	32,000	32,000 per drawing
Maximum connecting points per symbol	unlimited	0 - 6 or unlimited	unlimited
Maximum document dimensions	112 x 108 inches	8-x-8-inch to tabloid	96 x 43 inches
Number of colors supported	8	256	8
Multiple drawings open	separate files, RAM limit	hierarchical, RAM limit	hierarchical, RAM limit
Import/export and printing			
Export chart as PICT file	yes, through Clipboard	yes, through Clipboard	yes, as an Export option
Export note text	NA	yes	yes
Note-printing options	NA	selected symbol, whole chart	independent, by doc., by drawing
Page number/header	common background layer	logo, date, time, head, more	none, manually number pages
Structured reports	diagrams	diagrams, levels, comments, all	diagrams, levels, notes, reports

* TopDown 2.0 will incorporate this feature.

† TopDown 2.0 lets you grab any line segment not directly attached to a symbol.

These three flowcharting programs are feature-rich. This list of talents and limits presents the key elements that differentiate these programs from draw programs and from each other.

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Charting a Course

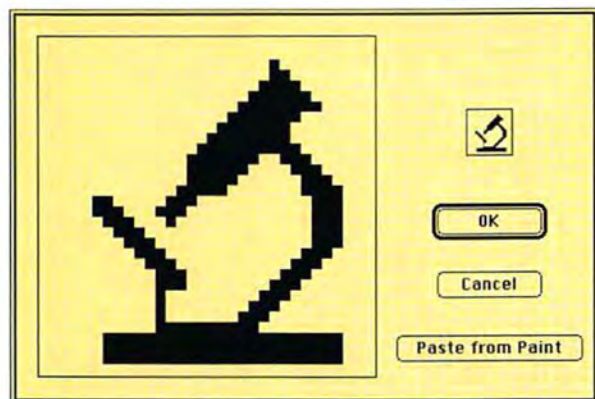


Figure 7: TopDown's bit-mapped-icon editor can import, create, or edit new icons that can serve as visual symbol enhancers.

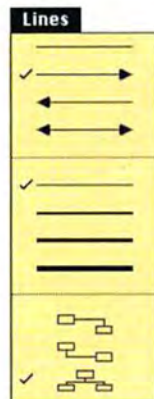


Figure 8: In TopDown, you can assign line-connection preferences as well as attributes to individual lines for better management of postshift reconnections.

large section of a chart.

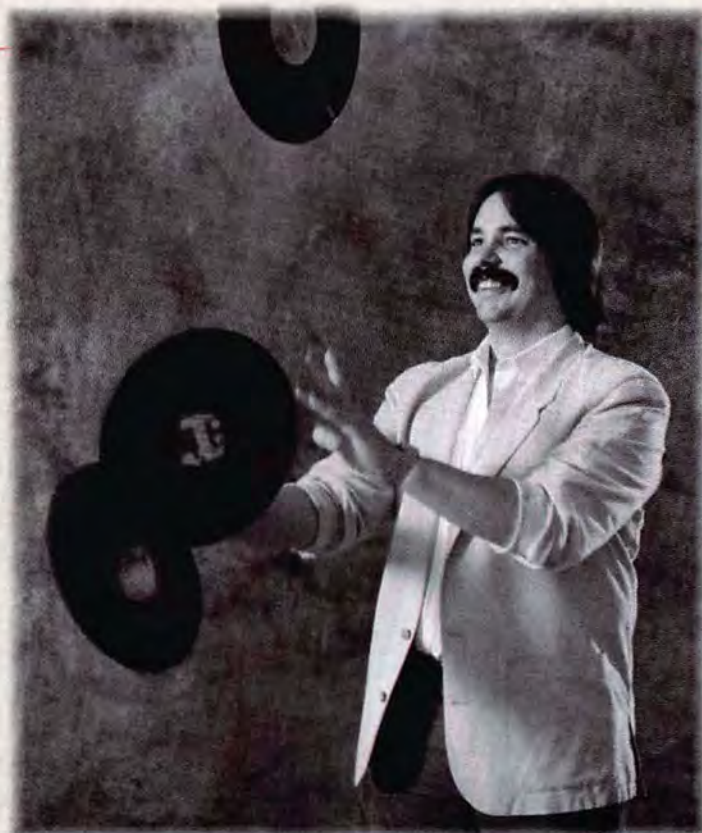
With TopDown's Note Card feature, you can attach up to 32K of text to each symbol, enabling you to write technical explanations or even live program code that you can print later and export as text with its indentation tabs intact. The Print dialog box lets you select the drawing(s) and

symbol(s) for which to print notecards.

TopDown's palette contains three banks of 12 symbols each. One bank holds the standard symbol set, and two hold rectangular symbols, each with a bit-mapped icon that's permanently grouped with it. The icons are editable in Fat Bits mode, and there's

also a facility for capturing a 32-x-32-pixel icon-sized swatch from any MacPaint-format file.

If you need to return quickly to a particular view after doing some editing away from the current page, you can choose Drop Anchor before you change views and then go anywhere else in the same drawing. To



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return, you simply use Go To Anchor. Each nested drawing has its own anchor point to which you can zip. For faster navigation through nested drawings, you can choose to see the nesting hierarchy as a list of titles. Double-click on a title at any level, and you're there — directly.

With TopDown's Clustering feature, you have the power to send a collection of drawing elements instantly to a lower level. TopDown replaces the demoted symbol with a new, shadowed symbol that's hierarchically above the symbol set.

The program is unique in that it generates reports that you can preview on-screen, save as text, and print. The Cross Reference report lists which symbols are attached to each symbol in the chart, regardless of the direction of flow. The Outline report shows you, by symbol number and title, the sequence of downstream

TopDown 2.0 Beta Watch

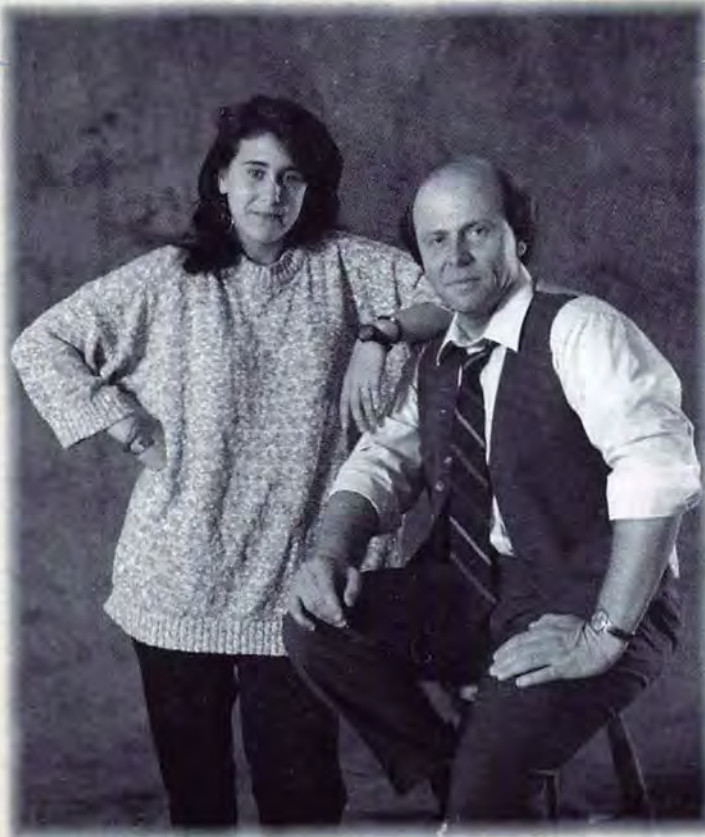
At the time of this review, I tested a beta copy of TopDown version 2.0, which should be shipping by the time you read this. It will incorporate significant enhancements in key areas. Its symbol palette will get two additional storage banks for custom symbols, full-fledged object-oriented symbols with a text-entry area. You'll be able to create symbols within TopDown with any combination of imported art, existing primitive shapes, and built-in sophisticated drawing tools. It will be possible to add, move, and remove polygon vertices. Connecting points on custom symbols will be established precisely on their faces rather than at an object's center or somewhere in space. Moreover, these will be master symbols that, when edited, will automatically reflect their changes in all places in the document where they're used.

You'll be able to grab line segments, as opposed to just vertices, and move them freely to make adjustments more easily, without handling two separate ends. TopDown's already potent navigation facility will be enhanced with a pop-up scrolling menu that presents a selectable list of drawings everywhere in the hierarchy. You'll also be able to bind text to a line, either overlaying the line or next to it. This upgrade could put TopDown at the head of the class.

symbols and the full details of any hierarchically lower drawings. The Errors report lists symbols that have data flowing in but none flowing out.

TopDown's Undo command restores a deleted item or a set of items.

In this, it does a very good job. Unfortunately, Undo recovers symbol deletions only. Fortunately, there's a Revert To Saved option that can help, provided you save frequently. Beefing up the Undo command is a high



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Charting a Course

priority on Kaetron's list of improvements for the program.

Charting Your Course

Flowcharting packages have crossed the threshold from being naive time-consuming assistants in stick-figure drawing to serving as bona fide efficiency tools. All these programs could use some extra intelligence in the line-routing area, which each developer admits is the toughest part. But someday not far off, you'll be able to put your symbols roughly where you need them, draw a few lines just to clarify what should be connected where, click on the Spiff Up button, and let it flow. 

Salvatore Parascandolo graduated from Flowchart U using MacDraw 1.9 exclusively. He majored in pseudoconnectivity and rectilinear tweaking and welcomes any objects that think for themselves.

The Bottom Line

Both **MacFlow** and **TopDown** are good choices if you need to produce conventional flowcharts of physical and logical processes, especially when right-angled connecting lines are used almost exclusively and symbol attributes must be consistent. The programs' abilities to create and navigate multiple nested charts are ideal for managing the potentially numerous components of a project design. TopDown's reports and hierarchy display give you more ways to see and reach your information. MacFlow's program launching can be an important asset in developing a walk-through visualization of your process.

MacFlow and TopDown also do a valiant job of keeping your connecting lines the way you want them. MacFlow gives you full control of where lines attach to each symbol's face, but its reconnecting mechanism can be pushed into making some pretty weird connections. TopDown keeps most of the control over attachment points and shifts them as needed, but it does let you control the type of each connector in your document and is generally better at managing its lines. Its 2.0 release, which should be available by now, adds more line options, full custom symbols, and likely half a mouse more to its rating.

DiagramMaker can serve standard flowcharting needs nicely. Its built-in organization-chart generator can save you lots of time. It's a good choice whenever you need connected objects of any kind, but right-angled connections aren't numerous. Its editable tool palette lets you construct your own primitives or even store complex logic blocks that you can later draw with one stroke. Its connecting lines aren't as right-angle smart as MacFlow's or TopDown's are, but the lines' flexibility makes them a joy to use, especially when no rigorous structure is required. DiagramMaker lacks a text-based note facility, which means that any sizable text components of your project have to be managed separately.

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Report Cards

DiagramMaker 1.1



A jack-of-all-trades object-linking program, DiagramMaker can be used to form a network of objects with connecting points at the centers, corners, and sides. It's a good alternative if you want a draw program that has automatic linking lines. It also does organization charts from indented text outlines.

Pros: Its palette-editing flexibility is excellent; lines join on contact and can be pulled into arcs, enabling numerous discrete connections; objects can be linked to objects in other documents.

Cons: No provision for right-angled-line maintenance; text blocks for imported objects are too large.

Requires: Mac 512K or later and 800K floppy-disk drive.

List Price: \$145.

Action Software, 1507 E. Franklin St., Suite 122, Chapel Hill, NC 27514; (919) 942-1111.

MacFlow 3.01



A capable process-flow diagrammer with hierarchical-nesting abilities, MacFlow offers good control over intersecting lines and symbols. It can import art and convert it to custom symbols. It tries to keep symbols correctly connected, optionally maintaining right-angled lines.

Pros: Smooth-working single-cursor operation; complete control over the number and type of symbol-connection points; easy manual editing of lines and alteration of anchor points.

Cons: Lacks individual control of line types; reconnection mechanism can go haywire with a major object shift; multiple on-screen documents must be viewed at the same magnification.

Requires: Mac Plus or later, System 6.02 or later, and two floppy-disk drives.

List Price: \$245.

Mainstay, 5311B Derry Ave., Agoura Hills, CA 91301; (818) 991-6540.

TopDown 1.1a



TopDown is the lead contender in flowchart and organization-chart production, offering a choice of connection modes for each individual line. Its diagnostic and text-based organization reports can be valuable management tools.

Pros: Has strong right-angle-reconnection talents, even with major object shifts, generally ensuring good reconnection; excellent navigation throughout hierarchy, view to view, and page to page; multiple drawings can have different levels of magnification.

Cons: Not enough user control of connection points; doesn't automatically number pages; offers no line nodes for attachment of other lines.

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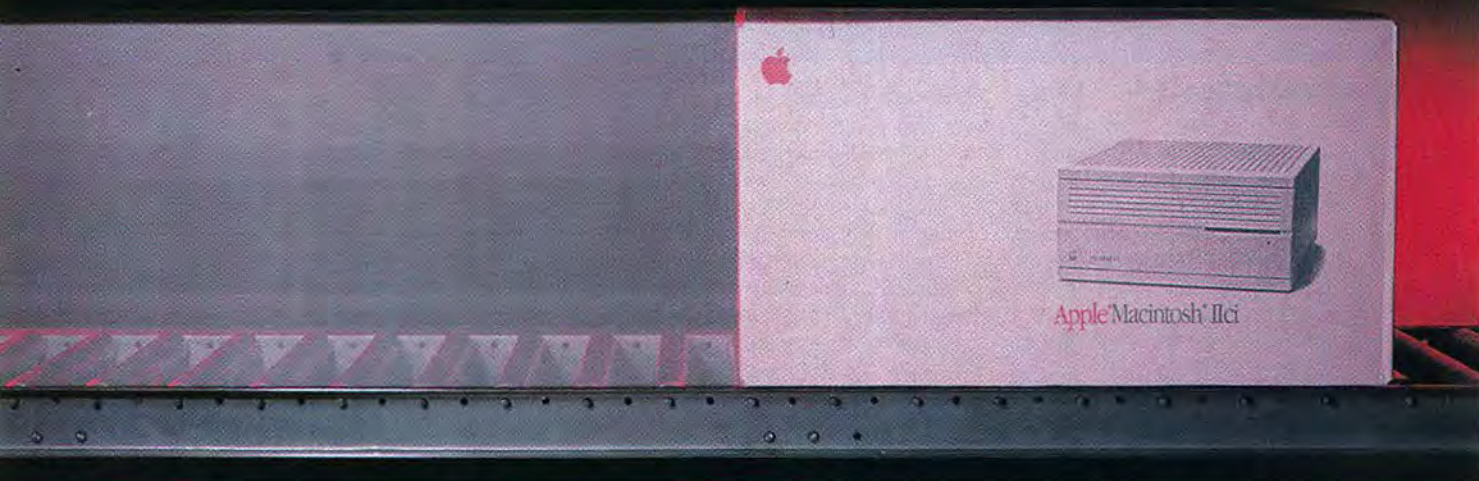
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Modems: 9,600 bps and Counting

Now available and affordable, a new assortment of lightning-fast modems shatters the 9,600-bps speed limit.

By Gordon McComb, Rik Myslewski, and the MacUser Labs staff

Like people, new technologies tend to be messy and unpredictable at birth and expensive as they're growing up. The successful ones develop standards and settle down. The lucky ones live to a ripe old age, retire, and are enjoyed by children.

Superspeed modems — those operating at 9,600 bits per second (bps) and above — have just reached adulthood. In their youth, they were wildly extravagant, notoriously incompatible, and frequently finicky about how they were treated. Only recently have they matured into a technology that's practical, affordable, and easy to use.

A 9,600-bps modem has the same purpose as its slower relatives: to let your computer communicate over the phone. Modems accomplish this by *modulating*, or transforming, your computer's digital signals into analog ones, which are then transmitted across phone lines, bit by bit, as audible tones. At the receiving end, another modem *demodulates* the signals, transforming them back into digital data — the 1s and 0s that are the building blocks of computer communication. The term *modem* is an acronym for *MODulator-DEMulator* (see the "How It Works" sidebar).

One quirk of the early superspeed modems was their refusal to work over

standard dial-up telephone lines. They required specially tuned — and specially priced — lines leased from the phone company. Over these nearly noise-free lines, a 9,600-bps modem used a variety of digital tricks to double its performance to a maximum of 19,200 bps.

Times have changed, and a harder class of these high-tech wonders has appeared. The newest superspeed modems are less affected by background noise, so they can communicate with each other over normal phone lines. Their prices have also dropped substantially, bringing them within reach of average business users.

To assess the state of the art, MacUser Labs examined eleven 9,600-bps modems costing less than \$1,500, all of which adhere to the V.32 standard for superspeed telecommunications. Two of the modems — the CONNECT V.32 Service and Racal-Vadic 9632VP — are the same unit packaged with different accessories. Three others — the Computer Friends LightSpeed, Digicom V.32 9624LE, and Prometheus ProModem 9600M Plus — also use identical hardware. The remaining six — the Bitcom Strata V.32, FastComm FDX 9696, Multi-Tech MultiModem V32, NEC N9631,

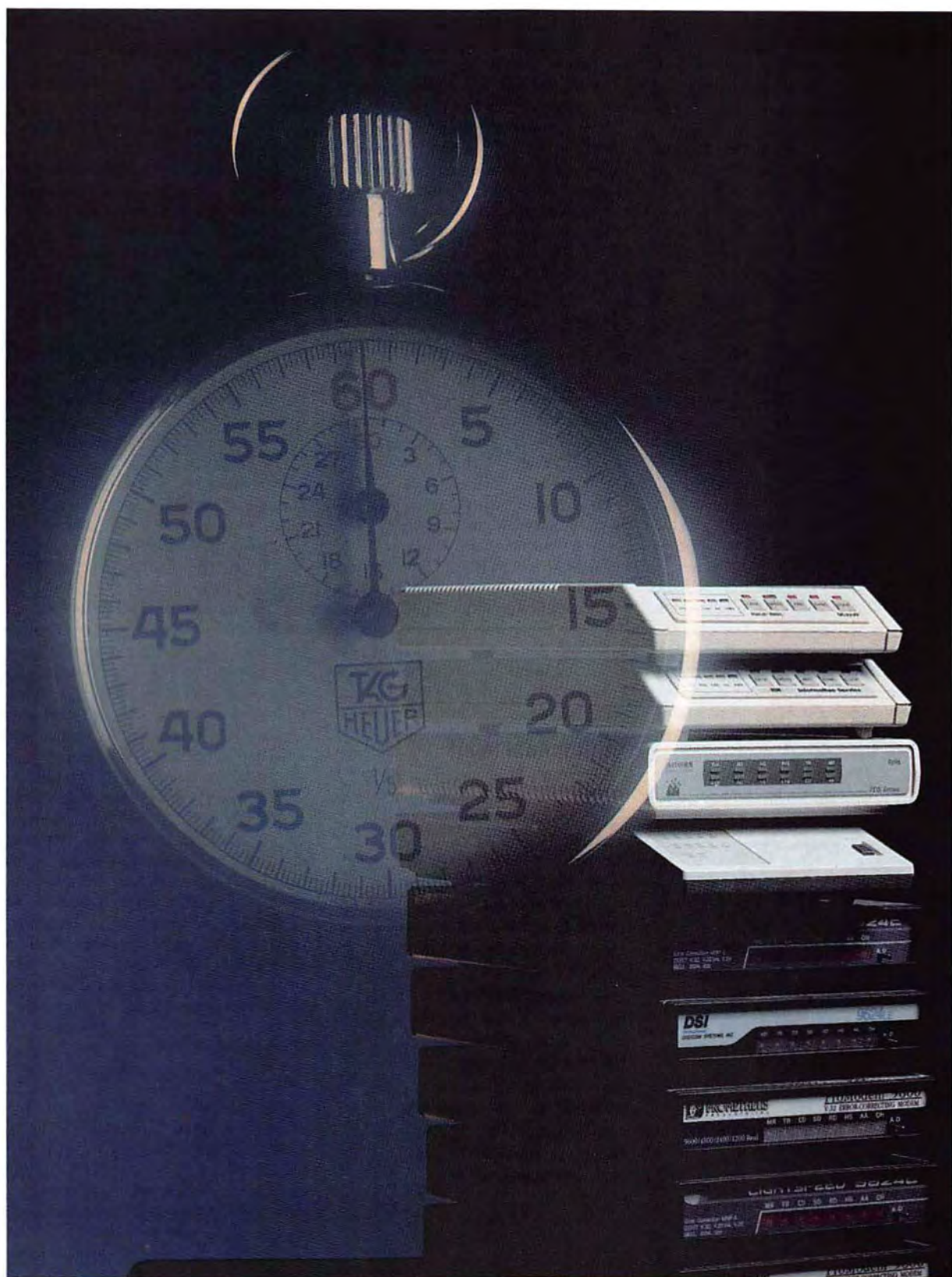
Telebit T2500, and U.S. Robotics Courier V.32 — exhibit numerous differences in both features and performance (see Table 1).

A superspeed modem is judged by how fast it can reliably transmit data over phone lines — its *throughput*. Accordingly, we tested each modem's speed and its resistance to errors caused by noise on the phone line. The results confirm that today's 9,600-bps modems are less finicky and more dependable than their predecessors. Even large amounts of noise had little adverse effect on most of them, and while none of the modems reached the ideal 19,200-bps limit, several topped 15,000 bps in certain situations.

The Need for Speed

At \$800 to \$1,500 each, the superspeed modems we tested are still costly enough to make you think twice before buying. Before joining life in the fastest lane, you should consider your communications habits, the type and variety of

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computers you connect with, and the kind of data you send and receive.

The power of these modems is best for transmitting and receiving files, not for interactive communication. A 9,600-bps modem is a blessing for programmers, desktop publishers, and others who must transfer huge files, because it's more than four times faster than a "high-speed" 2,400-bps modem. But if you use your modem mostly for real-time typing to exchange information with other computer users, you don't need the power of a superspeed modem — unless you type 10,000 words per minute.

Another ideal use is remote-control communication. Applications such as Farallon's Timbuktu/Remote and Microcom's Carbon Copy Mac let you call a distant Mac by modem and operate it exactly as if it were your own (see "Remote Control," May '89). Using a Mac by remote control is a boon to consultants, who often need to access files and programs so they can determine the cause of a problem or configure a system for a client. Although you can use a slower modem for remote operations, you'll suffer a distinct performance loss, as if you were working in slow motion.

With the appropriate networking hardware and software, you can also use a 9,600-bps modem to tap into a network from afar and access files and electronic mail. To your Mac, it looks just like a hard-wired connection. However, even though a 9,600-bps modem is vastly superior to slower modems for wide-area

networking, you still won't achieve network speeds; even slowpoke LocalTalk operates at 230,400 bps.

On the flip side, remember that it takes two to tango. A 9,600-bps modem won't do you any good unless there's one on the other end of the line, and superspeed modems are still relatively rare. For instance, don't expect to hook up your new modem and immediately connect at super speed to your favorite on-line or bulletin-board service. With the exception of CONNECT, no major dial-up service can handle these speed-burners — yet. Expect CompuServe, Dow Jones, and other popular services to add 9,600-bps service as V.32 modems become more popular. But don't worry about losing touch with these and other slowpokes, because all the modems we tested can downshift to compatible speeds and do so automatically when they connect to a slower modem.

Finally, don't expect to recoup your investment overnight with money you save on your phone bill. A good 2,400-bps modem can be picked up for around \$200 — one-fourth the cost of the cheapest superspeed modem. Your files will zip across the country four times faster at 9,600 bps, but if you pay 25 cents per minute between San Francisco and New York, you'll have to save a lot of quarters before you make up the difference.

Getting Up to Speed

You can't just attach a 9,600-bps modem to your Mac and immediately

reap the benefits. For one thing, standard modem cables don't support *hardware handshaking*, which controls the flow of data between Mac and modem. This capability is a requirement for superspeed communications (see the "Glossary" sidebar).

The Computer Friends and Prometheus modems include the proper hardware-handshaking cable. Two others — the CONNECT V.32 Service and Racal-Vadic 9632VP — don't require you to modify your cable. Instead, you make the necessary adjustment by sending a command to the modem through your telecommunications software. (The V.32 Service includes a cable that works fine after this adjustment is made.) For the rest of the modems, you must either find the correct cable or make a jumper cable (see this month's Labs Brief, "Modem-Cable Rewiring").

Next, make sure that the modem is configured correctly for your system. This will probably mean going through the manual — the FastComm FDX 9696 has an excellent one — to discover how to set the DIP (dual in-line package) switches on the back or bottom of your modem. Four of the modems can also be configured remotely, enabling you to set them up long-distance. But if you're setting up the modem in person, you'll be flipping DIPs to set such things as parity and start and stop bits. When you've finished, it's time for the next step — installing your favorite telecommunications application.

You'll need a program such as MicroPhone, Smartcom, or Red Ryder to manage the communications between Mac and modem and to access the Hayes Standard AT Command Set built into the modem's ROM. Two of the modems include the necessary software. Computer Friends LightSpeed comes bundled with Quick Link II, which has a text editor that lets you create and save any sequence of passwords or log-on commands. When you launch Quick Link II, it automatically configures your modem to the settings you previously defined and stored.

The ProModem 9600M Plus package from Prometheus Products includes MACKNOWLEDGE, a powerful program that's smart enough to automatically configure all aspects of your modem for best performance on any line. One of our favorite features is a built-in log of all access numbers for the major on-line services — just enter your area



MacUser Labs' director Andrew Eisner and his staff used professional telecommunications test equipment from Processing Telecom Technologies (PTT) to measure each modem's performance on simulations of three commonly used telephone lines — local, satellite, and terrestrial cross-country. Although all the modems use essentially the same communications techniques, their performance over these lines ranged from very good to only so-so.

How It Works: 9,600-bps Modem

We opened up a U.S. Robotics Courier V.32, the fastest modem we tested, to identify the components that enabled it to reach speeds of slightly less than 16,000 bps.

Telephone jacks

Two RJ11 telephone jacks connect the modem to the telephone line and allow connection to one telephone.

Serial port

Digital signals pass to and from the computer through the RS-422 serial port.

Computer-interface microprocessor

This chip controls all communication through the serial port.

Control microprocessor

The control microprocessor performs all MNP error-detection and data-compression protocols.

Program ROM

Instructions for the MNP protocols and other modem activities are contained in two program ROM chips.

Telephone interface

Analog signals are transmitted between the data pump and the phone line through the telephone interface.

Nonvolatile RAM

User-defined configuration settings remain in nonvolatile RAM when the modem is turned off.

Alternate-speeds microprocessor

This microprocessor takes over when communicating with a slower modem.

Status indicator lights

A row of LEDs provides information on modem activity.

Data pump

The Rockwell R9696DP data pump is the heart of the modem. The integrated analog chip on the right converts the computer's digital signals into analog signals that can be transmitted over a phone line as audible tones. This chip also filters noise from the incoming signal. Trellis-code modulation is accomplished by three digital-signal processors on the left. The echo-cancellation chip at the bottom enables full-duplex communication. Two high-speed static RAM chips provide work space for the calculations necessary for V.32 modulation.

code, and a dialog box pops up with the appropriate numbers.

Although it doesn't offer a full-fledged telecommunications program, the CONNECT V.32 Service includes Business Information Network software for accessing CONNECT's on-line service. This may sound like a limitation, but the fact that CONNECT throws in a free subscription to the service and one free hour of connect time sweetens the deal considerably.

Now it's time to switch on your new modem and face its bewildering array of

red lights. All the models have at least 8 LEDs (light-emitting diodes) as status indicators. A few, such as the FastComm, NEC, and U.S. Robotics modems, have as many as 12. While LEDs tell you instantly what the modem is doing, they also make things look more complicated than they really are. Except for the Connect and Speed indicators, you can basically ignore the rest, because the telecommunications software should provide adequate feedback about the progress and status of your calls. The other LEDs do come in handy, however, when you're

troubleshooting a stubborn modem.

If you plan to use your modem not only to call others but also to allow them to call you, now's the time to implement password security, which prevents unauthorized callers from accessing your computer. Your telecommunications program can access the modem's security features to let you set passwords; check the modem's manual for the proper procedures. The FastComm FDX 9696 has a simple but effective form of security—the caller is prompted for a password, and if it's wrong, the FDX 9696 modem simply

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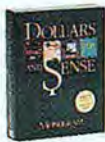
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Mail Workstation 2.0
(for 1 Station) 89.
(for 20 Stations) 1069.
Office 548.
PowerPoint 2.01 249.
Quick Basic Ver 1.0 65.
Word 4.0 247.
Works 2.0 179.
Write 78.

Monogram

Business Sense 1.2 268.
Dollars & Sense 5.0 79.

Nolo Press

For The Record 28.
Will Maker 3.0 32.

Northedge

Timeslips III 168.

Odesta

DataDesk Professional 288.
Double Helix 337.
Double Helix - Multiuser 289.
GeoQuery 1.0 198.

Olduval Software

MultiClip 49.
Plus 1.1 114.
Read-It! 2.0 249.
Read-It! Personal 98.

Orange Micro

Alphabits 68.

Paracom

Milo 158.
Swivel 3D 1.1 239.

Paragon Courseware

Nisus 2.0 239.
QUED-M 98.

Personal Bibliographic

Pro-Cite 198.

PLI Software

Turbo Back 49.
Turbo Cache 59.
Turbo Optimizer 25.
Turbo Spool 59.
Turbo Bundle (all of above) 120.

Power Up!

Address Book 58.
Address Book w/Leather Notebook Holder 83.
Fast Forms 89.

Preferred Publishers

Database 68.
Exposure 52.
Vantage 54.



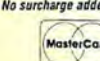
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Prometheus

MACKNOWLEDGE 124.

ProVUE

Panorama 1.1 204.

Quark

QuarkStyle 169.
XPress 2.11 485.

Sabastian Software

Image Grabber 24.

Select Micro Systems

Exstatix 1.2 214.
MapMaker 3.0 214.

Silicon Beach Software

Digital Darkroom 248.
Super 3D 2.0 (Color) 315.
Super Card 128.
Super Paint 2.0 124.

SmethersBarnes

Prototyper 2.1 198.

Smith Micro Software

Quicklink 48.

Software Ventures

Microphone 1.5 109.
Microphone II 215.

Solutions

backFax 124.
Curator 72.
SmartScrap & Clipper 45.
Super Glue 2.0 61.

SuperMac Software

Disk Fit 1.5 58.
Network Disk Fit 225.
PixelPaint 2.0 224.
PixelPaint Pro 398.
Sentinel 2.0 88.
SuperSpool 5.0 58.
SuperLaserSpool 2.0 298.
Multi User (1 to 5) 85.
Single User 85.

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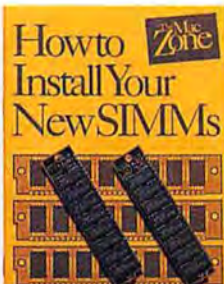
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Fujitsu

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Gray, Navy, or Wine	72.
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Labels, 216 (LaserWriter) ...	18.
(ImageWriter)	28.
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Table 1: Features of 9,600-bps Modems

	Bytcom Strata V.32	Computer Friends LightSpeed	CONNECT V.32 Service	Digicom V.32 9624LE	FastComm FDX 9696
List price	\$799	\$799	\$999	\$795	\$999
Speeds (bits per second)	300, 1,200, 2,400, 9,600	1,200, 2,400, 9,600*	300, 1,200, 2,400, 9,600	1,200, 2,400, 9,600	300, 1,200, 2,400, 9,600
Standards supported	Bell 103, Bell 212A, V.22bis, V.32	Bell 212A, V.22, V.22bis, V.32	Bell 103, Bell 212A, V.22bis, V.32	Bell 212A, V.22, V.22bis, V.32	Bell 103, Bell 212A, V.21, V.22bis, V.32 [§]
Cables included	power, RJ11 jack	power, modem, RJ11 jack	power, modem, [†] RJ11 jack	power, RJ11 jack	power, RJ11 jack
Software included	none	Quick Link II	CONNECT Business Information Network	none	none
Error detection/reduction	TCM, MNP 4	TCM, MNP 4	TCM, MNP 4	TCM, MNP 4	MNP 4, TCM
Data compression	MNP 5	MNP 5	MNP 5	MNP 5	MNP
Volume control	software	software	rear dial	software	rear dial
Phone-number storage	30 numbers	10 numbers	15 numbers	10 numbers	4 numbers
Security	none	password-protected callback	none	password-protected callback	password, hardware check [§]
Remote configuration	yes	no	no	no	yes
Status lights	9	8	11	8	12
Data-pump supplier	Rockwell	proprietary	Rockwell	proprietary	Rockwell
Size (W x D x H, inches)	7.5 x 12 x 2	6 x 9.5 x 1.5	6 x 10 x 1.5	6 x 9.5 x 1.5	6.5 x 10 x 1.5
Warranty	2 years	1 year	2 years	2 years	2 years

*The 300-bps Bell 103 protocol is available as a \$109 option.

†Hardware handshaking is not supported.

§V.22 and V.23 are available for use outside North America.

§Can recognize an FDX 9696 at the other end of the line.

**19,200 bps is possible only when communicating with another T2500.

††PEP (packetized ensemble protocol) is a noise-tolerant modulation scheme that can be used only in a link with another PEP-equipped modem.

‡‡MNP 5 is now available as a free upgrade.

hangs up. The Computer Friends, Digicom, Multi-Tech, and Prometheus modems offer the double protection of callback security. If the caller provides the correct password, your modem hangs up and calls the other modem back, using a preprogrammed telephone number.

As a last step, you may want to store commonly used phone numbers directly in your new modem. The modems' storage capacities range from 4 (FastComm and U.S. Robotics) to 30 numbers (Bytcom). In any case, most telecommunications programs provide all the on-disk number storage you need.

Meeting the Standards

After you've finished getting the modem ready to go, you must find someone to talk to. Unfortunately, affordable 9,600-bps modems are still few and far between, and many don't conform to the V.32 standard followed by the modems we tested.

V.32 is an industrywide modulation standard established by the Geneva-based

International Consultative Committee for Telephone and Telegraph (CCITT) to ensure compatibility among 9,600-bps modems. A V.32 modem can communicate with other V.32 modems regardless of make or model. Superspeed modems that don't comply with V.32 may not be able to communicate with your new V.32 modem. This is a minor consideration if you plan only to set up a private high-speed link, but it's a crucial concern if you want to communicate at 9,600 bps with the rest of humanity. Don't assume that every 9,600-bps modem obeys V.32's rules. There are plenty of modems out there that don't, and most of them are capable of communicating only with their own kind (see the "Seeing Through the Hayes" sidebar).

Most modems in use today comply with two earlier standards: V.22bis, which governs 2,400-bps modems, and Bell 212A, which provides guidelines for 1,200-bps modems (see Table 2). There are even a few Bell 103 modems still around, which are chugging along at

300 bps. Because of this, all the modems in this report automatically check the speed of the other modem in the link and adapt accordingly. All 11 work just fine at 2,400 and 1,200 bps, and all but 3—the nearly identical Computer Friends, Digicom, and Prometheus modems—can also communicate at 300 bps. (Computer Friends offers 300-bps compatibility as a \$109 option.) While you certainly wouldn't choose to communicate at 300 bps, there are still some connections, including small computer bulletin boards, that require such slo-mo transmission.

Bits and Baud

Slowing down isn't a matter of the modem's simply reducing the number of bits it sends over the phone line. Each transmission rate uses a completely different type of modulation and demodulation (see Figure 3). A V.32 modem that can transmit and receive information at 300, 1,200, 2,400, and 9,600 bps is actually the equivalent of four modems in one.

Multi-Tech MultiModemV32	NEC N9631	Prometheus ProModem 9600M Plus	Racal-Vadic 9632VP	Telebit T2500	U.S. Robotics Courier V.32
\$1,195	\$1,095	\$995	\$995	\$1,495	\$1,495
300, 1,200, 2,400, 9,600	300, 1,200, 2,400, 9,600	1,200, 2,400, 9,600	300, 1,200, 2,400, 9,600	300, 1,200, 2,400, 9,600, 19,200**	300, 1,200, 2,400, 9,600
Bell 103, Bell 212A, V.22, V.22bis, V.32	Bell 103, Bell 212A, V.22, V.22bis, V.32	Bell103, Bell 212A, V.22, V.22bis, V.32	Bell 103, Bell 212A, V.22bis, V.32	Bell 103, Bell 212A, V.22, V.22bis, V.32, proprietary	Bell 103, Bell 212A, V.21, V.22, V.22bis, V.32
power, RJ11 jack	power, RJ45 jack	power, modem, RJ11 jack	power, RJ45 jack	power, RJ11 jack	power, RJ11 jack
none	none	MacKNOWLEDGE	none	none	none
MNP 4, TCM	MNP 4, TCM	MNP 4, TCM	MNP 4, TCM	MNP 4, PEP ¹¹	MNP 4, TCM
MNP 5	MNP 5	MNP 5	MNP 5	Lempel-Ziv ⁴⁴	MNP 5
rear screw	rear dial	software	rear dial	software	front dial
10 numbers	9 numbers	10 numbers	15 numbers	10 numbers	4 numbers
password-protected callback	none	password-protected callback	none	none	none
yes	no	no	no	yes	no
8	12	8	11	8	12
Rockwell	proprietary	proprietary	Rockwell	Rockwell	Rockwell
7.5 x 11 x 1.5	5.5 x 11 x 1.5	6 x 9.5 x 1.5	6 x 10 x 1.5	8.5 x 13 x 2.5	8.5 x 12.5 x 1.5
2 years	1 year	2 years	1 year	1 year	2 years

Modem speed is rated in bits of information sent or received each second (bps). This rating is determined by multiplying two numbers: how many times the signal is modulated, or changed, each second (*baud rate*) and how many bits of information are transmitted with each change. Although most people use baud rate and bps interchangeably, these two measurements are equal only for the slowest, simplest modems.

Not surprisingly, the faster the modem, the more complex the modulation. A 300-bps modem modulates the pitch, or *frequency*, of its signal at a leisurely 300 times per second (300 baud). The frequency goes up or down to indicate either a 1 or a 0; each change thus provides 1 bit of information to the receiving modem.

A 1,200-bps modem takes a somewhat different approach. It modulates signals at a rate of 600 baud and transmits 2 bits of information with each frequency change, encoding each bit by changing the signal's *phase* — its position relative

to the previous signal change — rather than by altering its frequency.

Modems achieve speeds greater than 1,200 bps by altering the signal's *amplitude*, or strength, in addition to its phase. This scheme, called *quadrature amplitude modulation* (QAM), can transmit 4 bits per baud. At 600 changes per second (600 baud), the result is 2,400 bps. All the superspeed modems we tested use the phase-and-amplitude-modulation scheme, but they crank up the baud rate from 600 to 2,400. The resulting 9,600 bps leaves 2,400-bps modems in the dust.

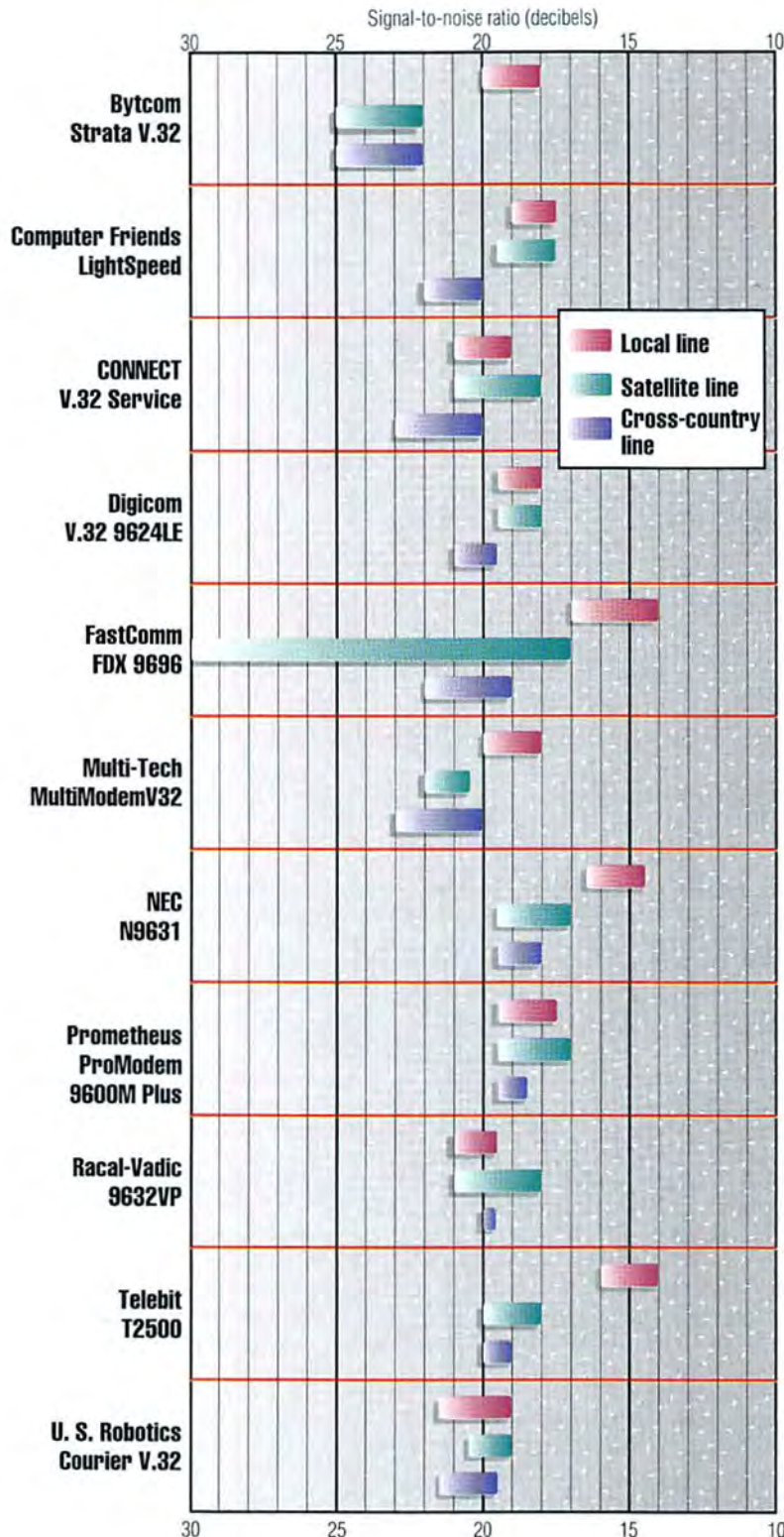
However, at 9,600 bps, the limitations of the phone company's lines and equipment begin to complicate matters. A telephone line can handle only frequencies between 300 and 3,000 hertz. This *bandwidth*, or useful signal area, is further reduced when you subtract all the frequencies the phone company needs for communicating with its own equipment. At 2,400 baud and with 4 bits of information per baud, the bandwidth is just not "wide" enough to allow two 9,600-bps

modems to communicate simultaneously without interfering with each other. In fact, the transmission of the originating modem takes up most of the available bandwidth by itself — no room is left in the bandwidth for the answering modem to respond.

The most common industry standards for telecommunications—including V.32 — require simultaneous, or *full-duplex*, communication. That is, both the originating and the answering modem must be able to "talk" and "listen" at the same time. Lower-speed modems achieve full-duplex transmission by talking and listening at different frequencies. As mentioned, the telephone bandwidth is too narrow for this strategy to work at 9,600 bps, so how do superspeed modems achieve full-duplex communication?

The solution, *echo cancellation*, is simple in concept but devilishly difficult in practice. When two 9,600-bps modems talk to each other across the same line at the same time, the interference between the two signals scrambles both

Figure 1: Error Rates



transmissions beyond recognition. Each modem hears both the tones that it's sending and the tones being received from the other modem. What's worse, these tones don't simply play together like a piano chord; instead, they combine into completely new tones with inappropriate meanings.

A V.32 modem makes sense of this cacophony by using echo cancellation. That is, it remembers the tones it has sent and subtracts them from the scrambled transmission it hears. The modem then passes on to its host computer what's left — the data sent by the other modem. This degree of modem "smarts" requires on-board DSPs (digital signal processors) capable of carrying out 25 million instructions per second. This is one reason why superspeed modems cost so much more than their slower relatives.

Make No Mistake

The V.32 standard permits — but does not require — an error-reduction scheme called TCM (trellis-code modulation), which adds yet another bit of information to each baud. The receiving modem checks this fifth bit against a complex coding system to see if an error has occurred in transmission; if it has, it attempts a correction. The Telebit T2500 is the only modem that doesn't use TCM at 9,600 bps.

Two other features, error detection and data compression, are found in most modems of this caliber even though they aren't part of V.32. Of the 11 modems, 10 provide MNP (Microcom Networking Protocol) Class 4 error detection and MNP Class 5 data compression. MNP classes are communications protocols licensed to each modem manufacturer by

Using our three simulated test lines, we fed each modem a random bit stream while increasing the amount of background noise. As the line quality worsens (left to right), the signal-to-noise ratio drops, and each modem begins to make errors. Each bar begins at the noise level at which errors begin and ends when they become so frequent that the modem disconnects itself. The NEC N9631 was the most error-free. The FastComm FDX 9696 produced the strangest results, tying for first place on satellite-noise tolerance after starting to make errors at extremely low noise levels.

Microcom (thus adding to the price of a 9,600-bps modem). These protocols are so popular that they have become informal industry standards.

The error detection scheme of MNP Class 4 is fundamentally different from error reduction as performed by trellis-code modulation. TCM is the first line of defense against transmission errors; it can find and fix an error anywhere in a packet of data. A modem using TCM attempts to make an educated guess after it detects an error—and it's smart enough to be right a good percentage of the time.

If TCM doesn't find or fix the error, MNP Class 4 takes over and asks the originating modem to retransmit the offending data packet. If the errors come too frequently, MNP Class 4 instructs the



Late Arrivals

At least five new low-cost V.32 modems have appeared since we completed our tests. Microcom (Norwood, Massachusetts), creator of the MNP protocols, has introduced the QX/3296c (\$1,129). As you might guess, a 9,600-bps modem from Microcom not only conforms to the V.32 standard but also includes MNP Classes 4 and 5.

General DataComm (Middlebury, Connecticut) has introduced a new line of superspeed modems, including the fully V.32-compatible DeskTop V.32E (\$1,095). Ven-Tel (San Jose, California) has announced the 9600 Plus External Modem (\$1,195 to \$1,395, depending on options). Ven-Tel claims that its data-compression protocols will enable two 9600 Plus modems to communicate with each other at speeds up to 38,400 bps. Anchor Automation (Chatsworth, California) has entered the V.32 market with the 96E4 (\$995). Anchor's 9,600-bps entry distinguishes itself with expanded auto-dialing capabilities and a five-year warranty.

By the time you read this, Farallon Computing (Berkeley, California) should have shipped its new Timbuktu/Remote Access Pack (\$1,295), which includes Timbuktu/Remote software, a Remote/WakeUp cable, and a repackaged Multi-Tech MultiModemV32. The package contains all you need to start up, access, operate, and retrieve files at 9,600 bps from a remote Mac.

— Rik Myslewski

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Capsule Reviews

Left to right: Computer Friends LightSpeed, CONNECT V.32 Service, Bytcom Strata V.32, FastComm FDX 9696, Digicom V.32 9624LE, and Multi-Tech MultiModemV32.



Bytcom Strata V.32 ⚡⚡⚡1/2

This low-priced modem finished in the top five for text-file throughput, although its performance with binary files was only average. It displayed good noise tolerance on our simulated local line but stumbled badly on both satellite and cross-country lines.

Pros: Inexpensive. Remote configuration. Stores 30 telephone numbers. Excellent text-file throughput.

Cons: Worst noise tolerance on satellite and cross-country lines. No security features.

Bytcom, Inc.

2169 Francisco Blvd.

San Rafael, CA 94901

(800) 227-3254 or (415) 485-0700

\$799

Computer Friends LightSpeed ⚡⚡⚡⚡

The LightSpeed is really a Digicom V.32 9624LE with a different front panel. Its performance in our tests was only average, but it's inexpensive and ready for use right out of the box. It comes with Quick Link II, a fast and easy-to-use telecommunications program, as well as the proper cable.

Pros: Inexpensive. Hardware-handshaking modem cable. Telecommunications software. Callback security.

Cons: 300-bps communications available only as a \$109 option.

Computer Friends, Inc.

14250 N.W. Science Park Drive

Portland, OR 97229

(800) 547-3303 or (503) 626-2291

\$799

CONNECT V.32 Service ⚡⚡⚡⚡1/2

Our all-around favorite, this modem is fast and error-resistant. It's actually a Racal-Vadic 9632VP with a different label. Although the two modems are similarly priced, the V.32 Service comes with a subscription to the CONNECT Business Information Network (a \$149 value). The package also includes one free hour of on-line time and a modem cable.

Pros: Comes with software and one free hour of access to the CONNECT Business Information Network. Excellent throughput. Can be configured internally to support hardware handshaking.

Cons: Low noise tolerance on local lines. No security features.

CONNECT, Inc.

10161 Bubb Road

Cupertino, CA 95014

(800) 262-2638 or (408) 973-0110

\$999

Digicom V.32 9624LE ⚡⚡⚡

This is the lowest-priced V.32 modem now available — by a margin of \$4. The 9624LE was an average performer in both throughput and noise-tolerance tests. Digicom V.32 hardware is also sold by Computer Friends and Prometheus Products.

Pros: Lowest price. Callback security.

Cons: Low text-file throughput. No 300-bps mode.

Digicom Systems, Inc.

279 Sinclair Frontage Road

Milpitas, CA 95035

(408) 262-1277

\$795

FastComm FDX 9696 ⚡⚡⚡

Unlike other modems using the Rockwell data pump, the FDX 9696 was not a top performer in the throughput and noise-tolerance tests. It repeatedly showed considerable errors on the simulated satellite line at relatively low noise levels, although it held on to tie for highest tolerance in the same test. A new FastComm modem (not available at press time) will include a 20-megahertz control microprocessor, which should improve throughput.

Pros: Remote configuration. Password security. Best noise tolerance on local lines. Excellent manual.

Cons: Worst noise tolerance on satellite lines. Stores only four phone numbers.

FastComm Communications Corp.

12347-E Sunrise Valley Drive

Reston, VA 22091

(800) 521-2496 or (703) 620-3900

\$999

Multi-Tech Multi-ModemV32 ⚡⚡⚡1/2

This Jekyll-and-Hyde modem was one of the top performers in text-file throughput, but its binary speed was the worst. It has a good assortment of features, but it's one of the priciest units.

Pros: Remote configuration. Excellent text-file throughput. Callback security.

Cons: Worst binary-file throughput. Low noise tolerance on satellite and cross-country lines.

Multi-Tech Systems, Inc.

2205 Woodale Drive

Mounds View, MN 55122

(800) 328-9717 or (612) 785-3500

\$1,195



Left to right: Prometheus ProModem 9600M Plus, NEC N9631, Telebit T2500, Racal-Vadic 9632VP, and U.S. Robotics Courier V.32.

NEC N9631

.....**|||||1/2**

Since the NEC N9631 was one of the slowest modems, its excellent noise tolerance really surprised us. It hung on to each telephone line, especially local and cross-country lines, long after most of the other modems gave up. As a result, it seems an excellent choice if you're plagued by noisy phone lines.

Pros: Excellent noise tolerance on all phone-line types.

Cons: Low text-file throughput. No security features.

NEC America, Inc.

110 Rio Robles

San Jose, CA 95134

(800) 222-4632 or (408) 433-1277

\$1,095

Prometheus ProModem 9600M Plus

|||||

The ProModem is really a Digicom V.32 9624LE with a different front panel, and it shares that model's average throughput and good noise tolerance. However, Prometheus sweetens the deal with the correct cable and MAckNOWLEDGE, a superior telecommunications application that includes ready-made log-on scripts for most on-line services.

Pros: Excellent telecommunications software. Hardware-handshaking modem cable. Good noise tolerance on all lines. Callback security.

Cons: No 300-bps mode.

Prometheus Products, Inc.

7225 S.W. Bonita Road

Tigard, OR 97223

(800) 477-3473 or (503) 624-0571

\$995

Racal-Vadic 9632VP

.....**|||||**

With an easy-to-use front panel and a command set that speaks English, the 9632VP is the friendliest V.32 modem around. It's also sold by CONNECT as the V.32 Service, which offers more features for the same price.

Pros: Excellent throughput on all lines. Can be configured internally to support hardware handshaking.

Cons: No security features.

Racal-Vadic

1708 McCarthy Blvd.

Milpitas, CA 95035

(800) 482-3427 or (408) 432-8008

\$995

Telebit T2500

.....**|||||**

The T2500 had the best binary-file speed, thanks to its proprietary Lempel-Ziv protocol for data compression. Unfortunately, it also had the worst speed for text files. It lacks both MNP Class 5 and trellis-code modulation, although the former should now be available as a free upgrade.

Pros: Best binary-file throughput. Remote configuration. Has 19,200-bps mode for talking to other Telebit T2500s.

Cons: Worst text-file speed. No MNP Class 5 data compression (to be available as a free upgrade). No trellis-code modulation. No security features. Expensive.

Telebit Corp.

1345 Shorebird Way

Mountain View, CA 94043-1329

(800) 835-3248 or (415) 969-3800

\$1,495

U.S. Robotics Courier V.32

|||||1/2

Big money sometimes delivers big performance, which is the case here. The Courier V.32 is the speed demon of V.32 modems, taking the checkered flag for text files and coming in second for binary transfers. Performance in the noise-tolerance tests was only average, and features are minimal.

Pros: Best text-file throughput. Excellent binary-file speed.

Cons: Stores only four phone numbers. Poor noise tolerance on local lines. No security features. Expensive.

U.S. Robotics, Inc.

8100 McCormick Blvd.

Skokie, IL 60076

(800) 342-5877 or (312) 982-5001

\$1,495

Acknowledgments

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originating modem to assemble the data into smaller packets. The smaller packets take less time to retransmit when an error is found, and more make it through on the first try. By using both TCM and MNP Class 4, a 9,600-bps modem can provide essentially error-free performance even over noisy phone lines.

Cutting Down the Noise

The erratic noise levels on phone lines are a major factor in modem performance. Accordingly, we gave each modem a chance to prove itself on recreations of three common line types — a local call, a bounce off a single satellite, and a cross-country terrestrial link — using testing equipment designed by Processing Telecom Technologies (PTT) of Huntsville, Alabama.

We chose these three lines because they are probably the ones you use most in daily communications and because they present three clearly different — and increasing — sets of problems. A local line is the cleanest, but even it picks up an occasional pop when rerouted by a switching device in the downtown phone office or a little hum when someone turns on a vacuum cleaner. The satellite line suffers most from echo, caused by a bit of the transmitted signal bouncing back to the modem that sent it. A cross-country line is toughest for most modems to negotiate, because it includes both the switching noise of a local call and the decrease in signal strength inevitable when crossing long distances.

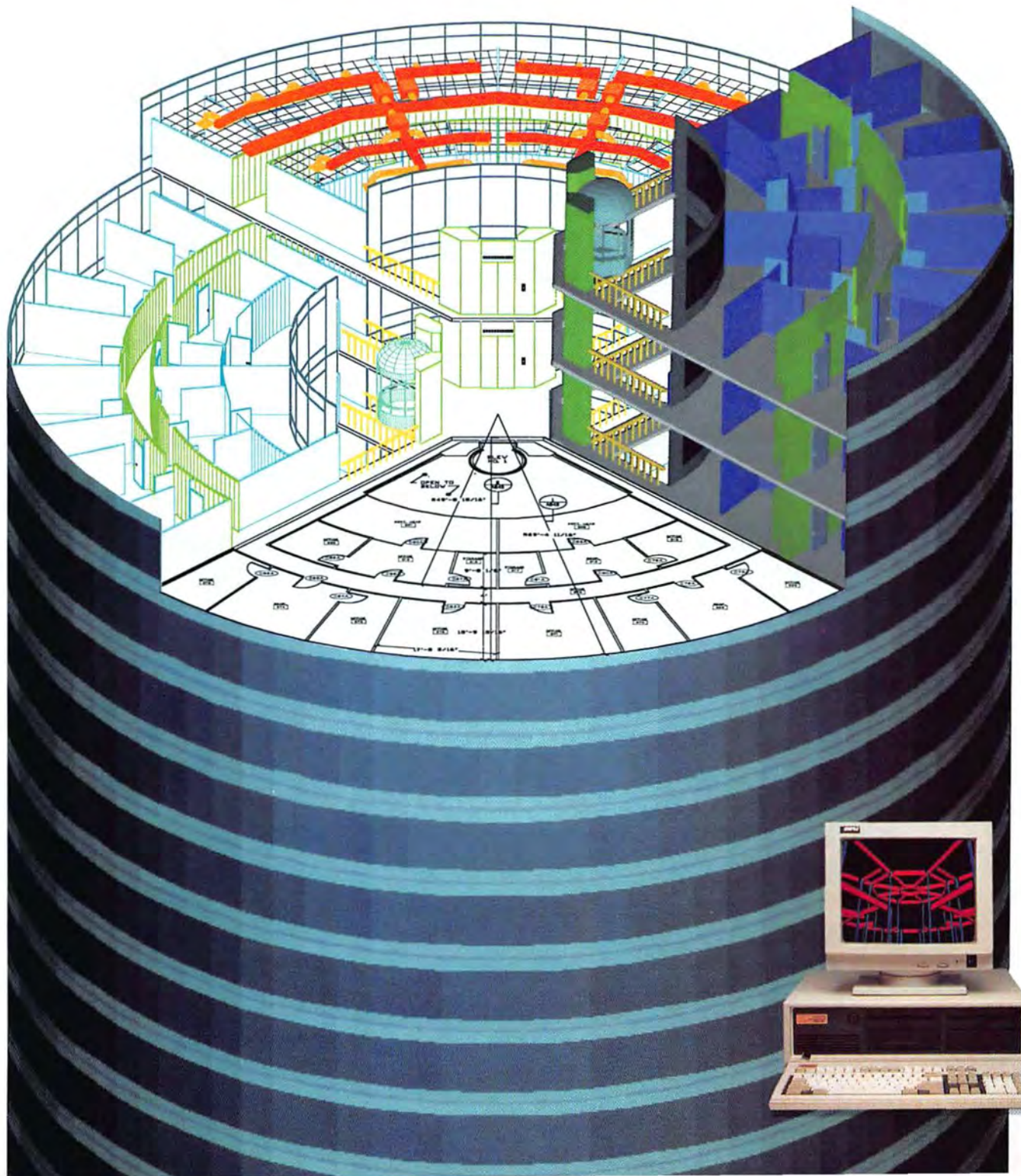
These phone-line gremlins are known as *line impairments*, and the more impairments that disrupt a line, the more errors that can occur. We used EZBERT software from PTT to synthesize local, satellite, and cross-country line impairments as defined by the Electronics Industry

To test throughput speed, we sent text and binary files between a pair of each manufacturer's modems, one at either end of a simulated dial-up connection. All the modems performed well above the 9,600-bps floor when transferring text, but only four could pass muster with binary files. The CONNECT, Racal-Vadic, and U.S. Robotics modems excelled at both text and binary transfers across all three types of phone lines. The Telebit T2500 did particularly well with binary files, thanks to its Lempel-Ziv data-compression protocol.

Figure 2: Throughput



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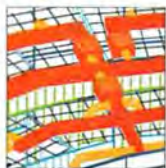
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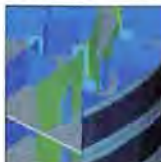
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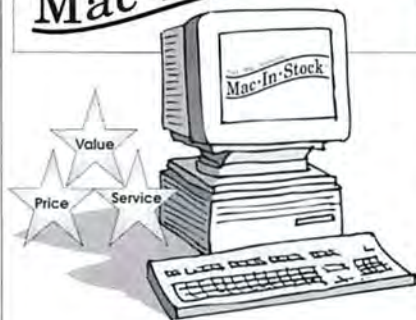
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Modems

Association specification EIA 496-A (yes, there are even standards for noise in the telecommunications industry). Our testing instruments included a 5000 Modem Test Set for noise-tolerance testing, a 5100 telephone-line simulator, and a 5151 echo/advanced impairment simulator.

Because MNP Class 4 asks the originating modem to resend bad data, we turned it off to get a more accurate assessment of how many errors each modem made when modulating a noisy analog signal back into digital data. This modulation takes place in a modem's heart and soul: its *data pump*. A sturdy, efficient data pump contributes to a modem's

performance by completing the modulation as fast as possible and by making few errors in the process. Because each error normally makes MNP Class 4 ask for a retransmission, high error rates slow throughput considerably.

Our tests revealed that although the modems varied in performance, even a large amount of noise had little adverse effect on most of them (see Figure 1). For each modem, there was a level of noise at which the data pump began to make errors and a final point at which the error level was so great that MNP Class 4 — had it been turned on — would have disconnected the modem from the noisy

Glossary

Bandwidth

The width of a communication channel, measured as frequency (in cycles per second, or hertz). A channel's bandwidth is a major factor in determining how much information it can carry.

Baud

The number of signal (or state) changes in a carrier per second; also referred to as *baud rate*. The maximum baud rate of a modem is limited by the bandwidth of the phone line. Named in honor of J. M. E. Baudot, a 19th-century French inventor of telegraph code.

Bell 103

The North American standard for 300-bps modems, implemented by Bell Labs (now a division of AT&T) in 1963.

Bell 212A

The North American standard for 1,200-bps modems, implemented in 1976.

Bits per second (bps)

The number of bits of data transmitted by a modem through a phone line in one second. To get the bps rate of a modem, multiply the number of signal changes per second (baud rate) by the number of bits of information carried by each change.

Carrier

An electrical signal that is used to carry information.

CCITT

A United Nations-sponsored organization, in Geneva, Switzerland, devoted to establishing worldwide communications standards. In English, it is known as the International Consultative Committee for Telephone and Telegraph.

Data compression

Packing data into a reduced format. Compressed data is in "shorthand" form and must be decompressed before it can be used by the receiving computer.

Data pump

The set of chips in a modem that modulates the digital signals supplied by the computer into analog signals for transmission through the phone lines as audible tones. The data pump of the receiving modem demodulates the analog signals into digital ones.

Dial-up line

Your average everyday home or business phone line. (See also *leased line*.)

Echo

(1) A faint return of the transmitted signal to the originating modem when a signal is relayed by a communications satellite. (2) The interference caused when a modem receives its own signal, experienced when two 9,600-bps modems communicate, each using most of the available bandwidth.

Error reduction

A hardware protocol that enables the receiving modem to examine incoming data for errors and to correct most of those it finds without requiring data to be re-sent. (See also *trellis-code modulation*.)

Error detection

A hardware or software protocol determining when a group of incoming data has an error. If one is detected, the receiving modem orders the transmitting modem to resend the data group that contains the error.

Full duplex

Two-way communications in which each modem simultaneously sends and receives data at the same rate.

line. The NEC N9631 showed the best noise tolerance on all line types, while the Bytcom Strata V.32 lost the phone connection on the satellite and cross-country lines with only moderate noise.

The most peculiar performer—so odd that we repeated the test several times to make sure it was true—was the FastComm FDX 9696. It showed better-than-average noise tolerance when tested over local and cross-country lines, but it began making errors much earlier than any other modem when we simulated a satellite transmission. However, the FDX 9696 hung in there as we worsened the line, and eventually it tied with the NEC N9631

and Prometheus ProModem 9600M Plus for highest satellite-noise tolerance. In short, it somehow managed to be both worst *and* best in the same test. Apparently, the gremlin most associated with satellite lines—echo—could make the FDX 9696 stumble but had a hard time making it fall.

Fast, Faster, Fastest

Data compression is what enables a superspeed modem to truly live up to its name. To accomplish transmission rates well over the modem's basic rating of 9,600 bps, MNP Class 5 data compression comes into play. This protocol shrinks

Half duplex

Two-way communications in which data is sent in only one direction at a time.

Hardware handshaking

The ability of the Mac or the modem to signal when to start or stop transmitting data. Handshaking is accomplished by sending a control signal over the modem cable rather than by issuing a software command. It helps regulate data flow whenever a modem slows down because of transmission errors or whenever the receiving Macintosh is unable to process data fast enough.

Hertz (Hz)

Cycles per second. The bandwidth of the average phone line is between 300 and 3,000 cycles per second.

Impairment

The generic term for a flaw in phone-line quality, usually caused by echo, noise, or a reduction in signal strength.

Leased line

A line intended for data communications that is leased from a telephone company. Leased lines are conditioned to a variety of specifications to keep impairments at a minimum. (See also *dial-up line*.)

Microcom Networking Protocol (MNP)

A set of error-detection and data-compression protocols, developed and licensed by Microcom, that have become unofficial industry standards.

Modem

A device that modulates, or converts, a computer's digital signals into analog signals for transmission over phone lines. The receiving modem converts the signals back into digital data. *Modem* is an acronym for *MOdulator-DEModulator*.

Quadrature amplitude modulation (QAM)

The modulation technique used in 9,600-bps modems that adhere to the V.32 standard, in which the signal varies in amplitude (voltage, or strength) and phase.

Standard

A set of rules or protocols that describe how a device should be manufactured so it will maintain interoperability (compatibility) with others of the same type from different manufacturers.

Trellis-code modulation (TCM)

A hardware protocol that transmits an additional bit in each baud. The extra bits are used by the receiving modem to predict whether the data received is error-free.

V.22bis

The worldwide standard for full-duplex 2,400-bps modems, proposed by the CCITT and adopted by the telecommunications industry in 1984.

V.32

The worldwide standard for full-duplex 9,600-bps modems, adopted in 1984. A V.32 modem must modulate signals at 9,600 bps by using QAM, it must transmit in full-duplex mode by using echo cancellation, and it must be able to adjust its speed to match that of the answering modem.

V.42

A worldwide standard for error detection in modems, adopted in 1988.

V.42bis

A worldwide standard for data compression in modems, adopted in 1989.

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Table 2: Telecommunications Standards

Standard	Year released	Bits per second	Baud rate	Duplex*	Where used
Bell 202	1961	1,200	600	half	North America
Bell 201	1961	2,400	1,200	half	North America
Bell 103	1963	300	300	full	North America
V.21	1964	300	300	full	outside North America
V.23	1964	1,200	600	half	outside North America
Bell 212A	1976	1,200	600	full	North America
V.29†	1976	9,600	2,400	half	worldwide
V.22	1980	1,200	600	full	outside North America
V.22bis	1984	2,400	600	full	worldwide
V.26ter	1984	2,400	1,200	full	worldwide
V.32	1984	9,600	2,400	full	worldwide

*All half-duplex modems can simulate full-duplex operation by using four-wire leased phone lines instead of standard two-wire lines.

†Used for facsimile (fax) machines and fax modems.

a file into the smallest possible number of bits and then expands the file back to its original size at the receiving end. Because some files can be compressed to half their original size, this squeeze-transmit-unsqueeze scheme lets two MNP-equipped modems — one sending and one receiving — transmit data at throughput rates of up to 19,200 bps. But as our throughput test results show, no modem reaches that ideal speed. Instead, less-than-optimal modem design and noisy phone lines reduce performance. (Two new protocols, MNP Class 9 and V.42bis, have a theoretical maximum of 38,400 bps. See the “On the Horizon” sidebar.)

The V.32 standard followed by the 9,600-bps modems we tested is only one of many devised for modem communications since British Telecom developed the prototype for a 110-bps modem in 1954. The standards most commonly used in North America are highlighted.

For our throughput tests, we used the same three simulated phone lines as before. The type of data being sent greatly influences a modem's speed, so we transmitted both binary and text files. Binary files such as Mac applications are difficult to compress because they're designed to be as small as possible in the first place. Our binary test used a resource file that had already been squeezed to 109K by

StuffIt. On the other hand, our text file — a 104K Word 4.0 file saved with the Text Only option — had plenty of fat for the compression algorithms to trim.

Although none of the modems could send text at the theoretical maximum of 19,200 bps, five units consistently surpassed 15,000 bps, and one — the U.S. Robotics Courier V.32 — scratched the underside of 16,000 bps on every text



Seeing Through the Hayes

No modem report is complete without mention of at least one Hayes product. Hayes is the market leader in modems for personal computers and the creator of the Hayes Standard AT Command Set, which is used in nearly every modem made today (see “Modem Speak,” November '89). When we began our testing, Hayes offered two 9,600-bps modems, but neither fit the criteria we established for this report. Its inexpensive 9,600-bps model didn't meet the V.32 standard, and the V.32-compliant modem cost more than the \$1,500 limit we set for “affordable” modems. Long after our tests were completed, Hayes announced a true V.32 modem for \$1,199, the V-series ULTRA Smartmodem 9600. Although we were unable to test this new offering, we did test the older, non-V.32 V-series Smartmodem 9600, but we didn't include its results with those of the true V.32 modems.

Hayes admits that the older V-series Smartmodem 9600 is not a full-duplex V.32 modem and that it uses a *ping-pong* protocol (which Hayes calls V.32HDX) to “simulate full-duplex V.32 operation.” Ping-pong is a half-duplex protocol; that is, the originating and answering modems take turns transmitting instead of sending and receiving simultaneously (full-duplex) as required by the V.32

standard. Ping-pong's chief benefit — to Hayes, not to modem users — is that it eliminates the need for expensive echo-cancellation circuitry.

The ping-pong method works fine for file transfers on clean lines because a file is sent in only one direction. However, error detection and data retransmission are far faster in full-duplex communications. In our tests, the V-series Smartmodem 9600 held its own against the slowest V.32 modems on local and cross-country lines. But when it tried to deal with the echoes in our simulated satellite line, its text-file throughput sank to half the average speed of the others.

The V-Series Smartmodem 9600 follows some of the specifications of the V.32 standards, such as quadrature amplitude modulation and the ability to match speeds with slower modems, but this isn't enough to make it compatible with the other modems we tested. If you require compatibility, consider the new V.32-compatible Hayes V-series ULTRA Smartmodem 9600 or one of the V.32 modems we tested. Contact Hayes Microcomputer Products at 705 Westech Drive, Norcross, GA 30092; (404) 441-1617.

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transfer (see Figure 2). When it came to binary files, however, only four modems were capable of speeds greater than 9,600 bps.

The Telebit T2500 was the champ at binary-file transfers and consistently transmitted both text and binary files at about the same rate (around 11,500 bps). The Telebit modem uses a data-compression protocol known as Lempel-Ziv,

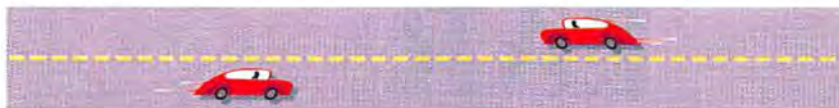
which is clearly superior at compressing binary files. Unfortunately, the proprietary Lempel-Ziv scheme works only for file transfers to another Telebit T2500 modem. By the time you read this, the Telebit T2500 should also offer MNP Class 5 data compression. MNP Class 5 will handle compression below 9,600 bps, and Lempel-Ziv will take over at more rapid rates.

Lonely at the Top

Except for price, the 9,600-bps modems we tested share more similarities than differences. Each follows the V.32 standard, and all but one include trellis-code modulation for error reduction, MNP Class 4 for error detection, and MNP Class 5 for data compression. Even so, differences in performance do exist, so you should weigh the pros and cons of

Figure 3: Same Highway, More Traffic

300 bps



The cars are spaced far apart, and just 300 cars — each containing only a driver — are going by every second. This leisurely situation represents both 300 baud and 300 bits per second (bps).

1,200 bps



The amount of traffic has doubled to 600 cars per second (600 baud), and each car contains a second person.

2,400 bps



At 2,400 bps, the number of cars per second remains the same (600 baud), but there are four people in each car.

9,600 bps



There's no more room in the cars, and the highway is jammed with bumper-to-bumper traffic. With four people in each car, and cars streaming by at 2,400 per second, we have reached 9,600 bps.

Modem designers have recently learned to pack more and more data onto the same "highway" — the dial-up telephone system. To understand how the traffic has increased, imagine a two-lane highway with cars going in either direction. Each car represents a change in the signal sent by the originating modem. Expressed as changes per second, this measurement is called the *baud rate* of the modem. Each person riding in each car represents a bit of information being sent to the receiving modem. The speed of electrical impulses never varies, so our "baudmobiles" must always travel at the same speed down this data highway. The two-way traffic represents full-duplex operation across a phone line.

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	%	119%	140%	150%	141%	108%	0%
	Gross Profit	\$6,552	\$9,102	\$10,425	\$6,438	\$10,140	\$21,300

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FR: Peter Cohen

DT: November 13th, 1989

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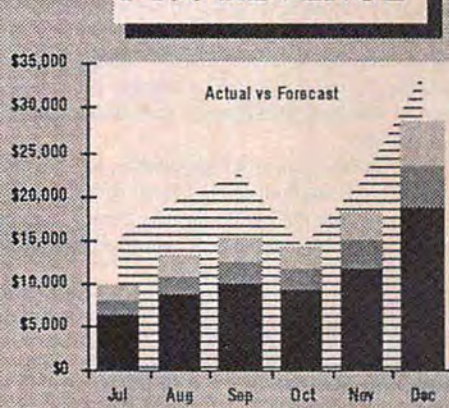
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each modem carefully and match them to your needs.

Consider how you will use your new superspeed modem. Will you be sending files down the street or bouncing them off a satellite? Do you plan to download highly compressed text files, or will you be tossing bulky applications and graphics files back and forth? Do you care what's included for the price you pay, or do you already have all the cables and software that you need? Find the modem with strengths that match your needs, and you're certain to be happy with your choice.

And remember, as with any other maturing technology, 9,600-bps modems will inevitably get less expensive as they become more common. In a year or two, they may be as inexpensive as 2,400-bps modems are today — and there will be far more modems for you to communicate with at super speeds. So is it really worth all that extra cash to be the first with the fastest? Sure it is . . . 

Gordon McComb writes frequently about computers and high technology and recently became a father for the second time. As a brand-new associate editor at MacUser, Rik Myslewski is concerned that hundreds of thousands of people will now mispronounce his name.

The Bottom Line

One man's "affordable" modem is another man's luxury. Before you shell out \$800 to \$1,500 for a superspeed modem, be sure that an inexpensive 2,400-bps model won't meet your needs, and remember that you can talk at super speed only to other 9,600-bps modems. But if you want lightning-fast file transfer or remote-control communications, by all means pay the premium. Nothing beats a 9,600-bps modem for saving that most precious commodity — time.

Three modems scored high enough to be considered "best buys," but we gave the nod to the **CONNECT V.32 Service** (\$999). It has blazing speed, a good bit-error rate on the three line types we tested, and a generous two-year warranty. Its price includes a \$149 subscription — with software — to CONNECT, the only major on-line service that offers 9,600-bps access (and the first hour is free). In addition, the V.32 Service doesn't require you to modify the modem cable to support the hardware handshaking needed for superspeed communications; it can make the necessary changes internally.

Close behind — very close — is the **Racal-Vadic 9632VP** (\$995). There's a reason for this neck-and-neck performance:

They're the same modem. All CONNECT adds is a tiny label stuck over Racal-Vadic's name. However, Racal-Vadic doesn't include all the goodies that CONNECT adds to the V.32 Service package, and the 9632VP warranty is just one year.

Our second runner-up, the **U.S. Robotics Courier V.32** (\$1,495), is the speed demon of 9,600-bps V.32 modems and might have been our top choice if price had been no object. However, you must decide if a marginal increase in speed is worth a substantial increase in price.

Honorable mention goes to two slower but feature-laden modems: **Prometheus Products ProModem 9600M Plus** (\$995) and **Computer Friends LightSpeed** (\$799). These are clones of the **Digicom V.32 9624LE**, but they include powerful and easy-to-use telecommunications applications. As with the V.32 Service, both are ready to use straight out of the box, and their cables are fine just as they are. If you want a complete V.32 modem package, either the ProModem 9600M Plus or the LightSpeed will let you jump on the superspeed bandwagon the quickest and the easiest — even though your wagon will move a lot faster if you hitch it to one of our three top choices.

On the Horizon

In the next five to ten years, our current telephone network will be replaced by an entirely new digital data-transmission medium called ISDN (Integrated Services Digital Network). Until the ISDN network reaches into every home and office in the country, however, new products and services will continue to serve the current analog telephone network.

For example, Rockwell engineers are putting the finishing touches on a single chip that will include all the basic functions of both a V.32 and V.29 (fax) modem. Modems using this chip should appear in mid-1990. Microcom's most recent offering, MNP Class 9, can achieve a 4:1 data-compression ratio with a theoretical maximum throughput of 38,400 bps. Two new international standards, V.42 and V.42bis (bis is the French abbreviation for second), also provide 38,400-bps performance. Despite their names, V.42 is not a replacement for V.32, and V.42bis is not an enhancement of V.42. Instead, V.42 is an error-detection scheme, and V.42bis is a data-compression routine that uses the Lempel-Ziv protocol. Future V.32 modems will comply with these standards; the one you buy today should be easy to upgrade.

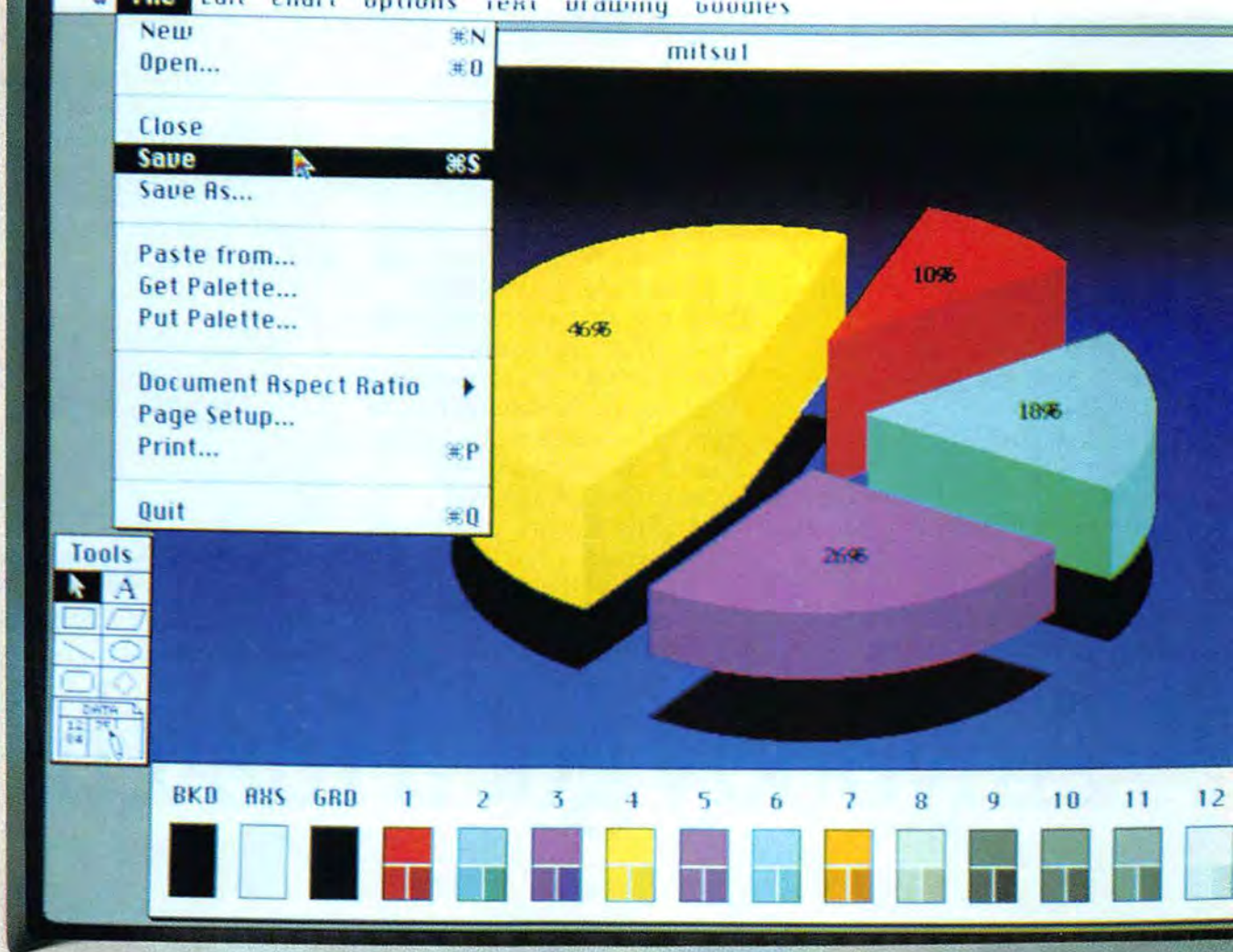
A modem cranking out 38.4 Kbps (kilobits, or thousands of bits, per second) is pushing the theoretical limit for transmission through standard phone lines. But you can go much faster — if you're willing to pay the price. Most telephone companies can provide data-

communications channels that range from 56 Kbps to 45 Mbps (megabits, or millions of bits, per second). Private fiber-optic transmission circuits are available that reach speeds as high as 600 Mbps. But even the relatively straightforward 1.54-Mbps communications service known as T1 requires interface equipment costing at least \$5,000 at each end, and your monthly payments to the phone company can easily reach thousands of dollars.

If you can, hang on until ISDN becomes available. An ISDN-connection device called a BRI (basic rate interface) will provide you with two separate channels of 64-Kbps communications for a monthly charge of less than \$50. Unlike some other superspeed solutions, BRI will keep you connected with the rest of the low-speed world. Your telephone company will also offer a higher-priced service called ISDN primary rate, which will have 24 communications channels totaling 1.54 Mbps — sufficient for voice, data, and compressed-video teleconferencing.

If you're willing to convert to costly fiber-optic connections, broadband ISDN will let you reach 2.4 Gbps (gigabits, or billions of bits, per second). This speed's phenomenally wide bandwidth will be capable of simultaneously carrying the equivalent of more than 20,000 TV channels. But don't rush to sign up — broadband ISDN won't become widely available until the next millennium.

— Reese Jones



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The right cable keeps your Mac and modem on speaking terms. The MacUser Labs staff shows you what to do if your modem cable can't keep up with the new breed of high-speed modems.

If you go to your local computer store and ask for a Mac modem cable, there's a very good chance that you'll get one that isn't wired right for hardware handshaking, which controls the data flow between your Mac and a modem. With the new generation of low-cost, high-speed modems and the widespread implementation of data-compression schemes, handshaking (or flow-control) hardware techniques have become a big issue. (See the glossary for an introduction to the language of handshaking.)

The problem is that the Apple modem cable has only enough pins to implement hardware handshaking in one direction. The cable is still usable, but it can't exploit the full impact of your high-speed modem.

Fortunately, there's more than one way to solve this problem. Although you *can* spend another \$40 or so to get a properly configured cable, there are also several alternatives — from adapting the cable you already have to making a jumper cable. MacUser

Labs has come up with the following three (and a half) suggestions.

1. Make your own jumper cable.

This is easier than it sounds: It'll cost less than \$10 and take only about half an hour of your time.

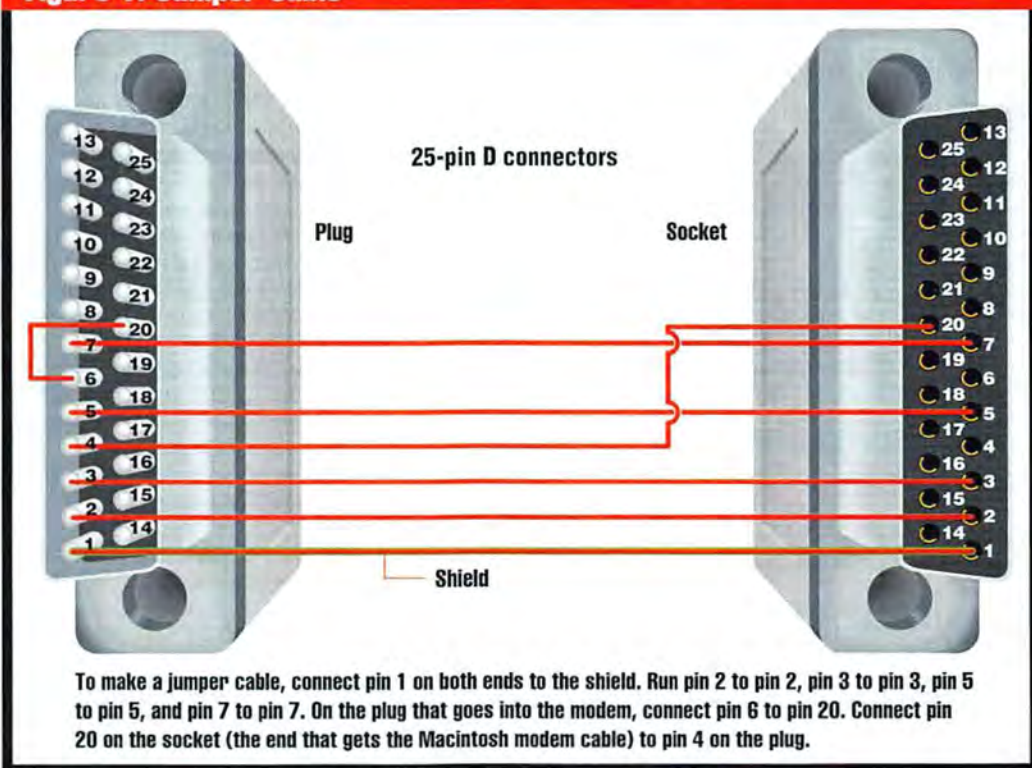
You need about 6 inches of five-conductor shielded cable, preferably unpaired 22- or 24-gauge five- or six-conductor cable, such as Belden-type 9535 or 9536. (If you have a piece of six-conductor paired cable lying around, however, it will probably work just fine.) You'll also need a 25-pin D-connector plug and socket. You can buy these through your local electrical-supply store or mail-order from a firm such as DIA.

Hook up pin 1 on both ends to the shield. Pin 1 is normally the chassis ground. Then run pin 2 to pin 2, pin 3 to pin 3, pin 5 to pin 5, and pin 7 to pin 7.

On the plug (the one that goes into the modem), connect pin 6 to pin 20 so the modem will think that

**By Andrew Eisner
and the MacUser Labs staff**

Figure 1: Jumper Cable



ANNOUNCING



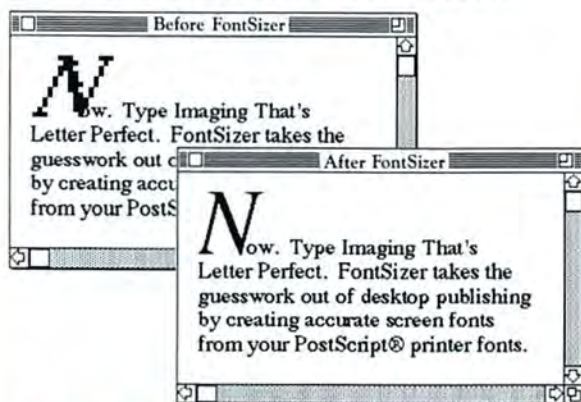
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Farallon
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DTR (data terminal ready) is always on. To swap DTR and RTS (request to send), connect pin 20 on the socket (the end that gets the Mac modem cable) to pin 4 on the plug (see Figure 1).

2. Buy a cable.

Prometheus sells a properly configured cable (the same one that comes bundled with its V.32 modem) for \$39. Hayes also sells one through its customer-service department for \$32.95.

Other companies, such as Farallon and Computer Friends, are aware of the cable problem and now supply a hardware-flow-control cable with their modems. Farallon's cable (\$49.95) not only supports hardware flow control but also includes a connector

Glossary

Breakout box

A device that is placed in the serial data line so that all data lines can be monitored or rerouted. Usually LEDs in the box indicate the logic state of the serial data line, DIP switches open or close lines, and jumper cables interconnect lines.

Data compression/decompression

Modems compress the data they send and decompress the data they receive in order to get more than 9,600 bps out of the Mac and the modem. To achieve this higher throughput, the modem has to get the data from the computer at a rate faster than 9,600 bps (the next-highest rate of 19.2 Kbps is commonly used, as it is an integer multiple of 9,600).

Hardware handshaking

Hardware handshaking controls the data flow between Mac and modem. When the modem slows down because of noise and retransmissions or if the receiving Mac can't process the data fast enough, both the Mac and the modem must have some way of telling each other to stop sending it. This is referred to as flow control or handshaking.

CTS

Most modems toggle the CTS (clear to send) line to tell the Mac when to start and stop.

RTS

Modems monitor the RTS (request to send) line to see if the Mac wants data or not.

DTR

DTR (data terminal ready) lets the modem know if the terminal, or the Mac, is on or off.

for the ADB (Apple Desktop Bus) port, where the carrier detect from the modem toggles the power-up line and turns your Macintosh on.

3. Get an RS-232 breakout box.

These cost about \$30 and can be purchased from Global Computer Supplies or other mail-order companies.

Connect the breakout box so that the Macintosh is connected to the DTE (data-terminal equipment) side and the DCE (data-communication equipment) side goes to the modem. Place the DIP (dual in-line package) switches for pins 4, 6, and 20 in the open position, and use one of the jumpers to connect pin 6 to pin 20 on the DCE side. Connect pin 20 from the DTE side to pin 4 on the DCE side.

And what's method 3 1/2?

Well, you *can* adapt the cable you already have. The problem is that while you're adding hardware flow control, you're sacrificing DTR, which the modem normally uses to tell if the computer is on or not. If DTR goes to an "off" logic state in some cases, the modem will hang up. This is a convenient feature that saves you the trouble of having to tell the modem to disconnect the phone line.

The Apple modem cable specifies that pin 2 on the Mac goes

The Bottom Line

There's no question about it: If you're going to be doing high-speed data communications using data compression, you need hardware handshaking. For a few bucks in parts and a half hour of your time, you can have a little **jumper cable** that you can put into the line or take out as you see fit.

If you're all thumbs or don't have any spare time and want a finished-looking cable, then buy one from any of the vendors mentioned. The **Farallon cable** is worth the extra bucks for the "wake-up" feature, which can be handy if you don't want to leave your Mac on when you go home.

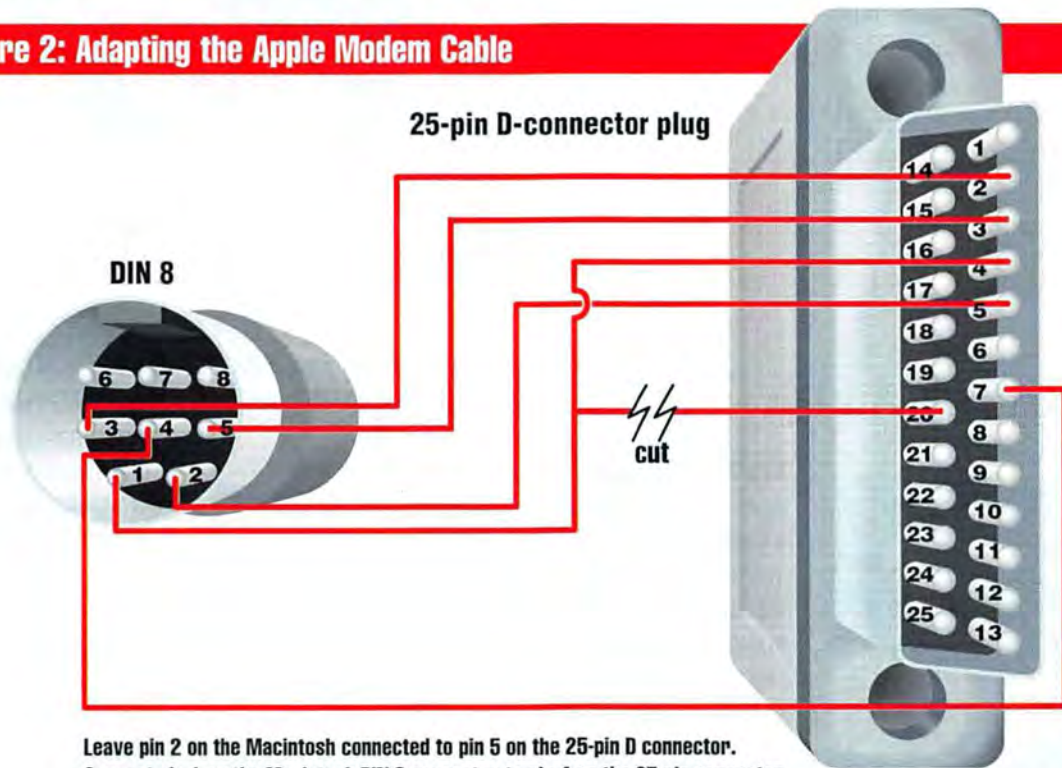
The **breakout-box** solution is both costly and — unless you already have a spare one lying around — impractical: You tie up an expensive piece of test equipment for a special purpose.

— Andrew Eisner

to pin 5 on the 25-pin RS-232 connector, which allows handshaking in one direction. The other control line on pin 1 on the Mac connector goes to pin 20 on the 25-pin connector, which is DTR. Since most modems want to use RTS (pin 4 of the 25-pin connector), it makes sense to move the line from pin 20 to pin 4. This works as long as you tell the modem to ignore DTR or set the control voltage high (see Figure 2).

Andrew Eisner is MacUser Labs' director and resident modem-cable expert. He has been working with computers longer than he cares to admit.

Figure 2: Adapting the Apple Modem Cable



Leave pin 2 on the Macintosh connected to pin 5 on the 25-pin D connector. Connect pin 1 on the Macintosh DIN 8 connector to pin 4 on the 25-pin connector. You will need to tell the modem to ignore DTR or set the control voltage high.

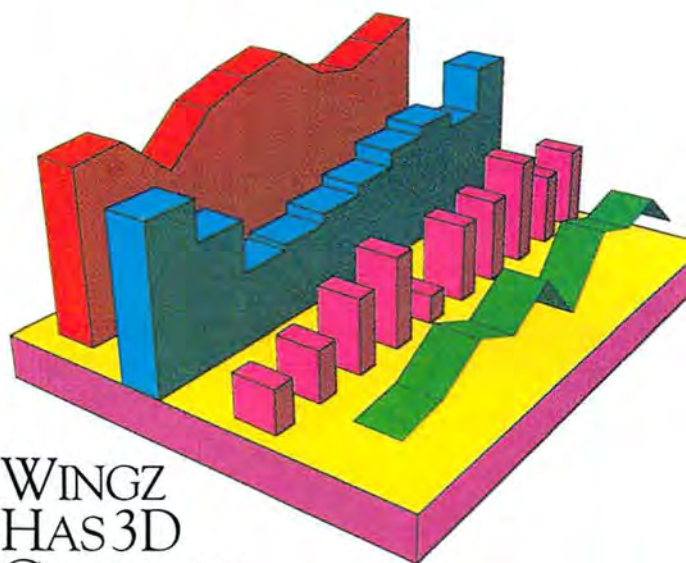
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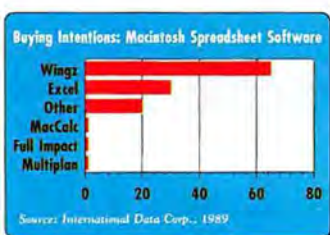
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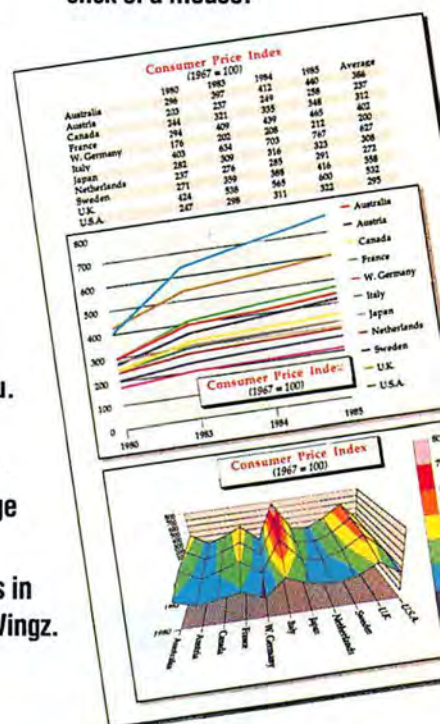
easier and faster than menus or typing in commands. (You can also put other Macintosh controls, including radio buttons, check boxes and slide bars, directly onto the worksheet.) Just as important, buttons unleash the power of HyperScript. So you can attach lists of frequently used commands to buttons, and then execute them with the click of a mouse.

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POWER TOOLS

EDITED
BY JAMES BRADBURY
AND KRISTI COALE

Wingz gets much of its power from its versatile scripting language. Here we build a sample script from the ground up — gaining the ability to operate on every selected cell in a spreadsheet.

Power Scripting with Wingz

Wingz, the new kid on the spreadsheet block, joins a growing number of Macintosh applications that include their own programming language. HyperScript, Wingz's high-level language, supports projects as simple as creating shortcut macros or as complex as developing customized applications.

Although the Wingz manuals and on-line help are an excellent reference for HyperScript's commands and functions, they don't explain how to put these commands together to create working scripts.

In this article, we'll look at one programming problem: how to write a script that works with all selected spreadsheet cells. Even if you're not interested in programming, you can use the time-conversion script shown in Figure

2. The last section of this article explains how to attach the script to a menu command.

Selectivity Is Everything

In Wingz and other spreadsheets, you can select multiple ranges by selecting one range and then pressing the Command key as you select each additional range. Most Wingz commands apply to all selected cells, even when multiple ranges are selected, so you can easily change the format, font, or style of all the cells in a complex selection. Our goal is to develop a format for custom scripts that work the same way.

We'll develop a "template" script (see Figure 1) that shows how to work with selections and then use that template to write a working script (see Figure 2) that makes it easier to enter

By James Finn

Figure 1

```
{ Template for script that handles arbitrary selections }
{ Written by James Finn, 8/8/89 }

DEFINE RANGENUM      { number of ranges in selection }
DEFINE THERANGE      { current range }
DEFINE FIRSTROW, FIRSTCOL { first row, column in current range }
DEFINE R, C          { current row number, column number }

REPAINT OFF { for speed - don't redraw screen until the end }

FOR RANGENUM = 1 TO NRSELECTIONS() { for each selected object }
  IF SELECTIONTYPE(RANGENUM) = 1 { must be cell or range }
    THERANGE = SELECTION(RANGENUM)
    FIRSTROW = ROWOF(THERANGE)
    FIRSTCOL = COLOF(THERANGE)
    FOR R = FIRSTROW TO (FIRSTROW + ROWS(THERANGE) - 1)
      FOR C = FIRSTCOL TO (FIRSTCOL + COLS(THERANGE) - 1)
        { do what you want to do with cell R,C }
      END FOR
    END FOR
  ELSE { give error message, saying which selection was bad }
    MESSAGE "Selection " & RANGENUM & " is not a cell or range"
  END IF
END FOR

REPAINT ON { redraw the screen }
REPAINT WINDOW
```

Figure 1: This template is the model for a Wingz script that works with every cell in a selection, even if the selection includes multiple ranges.



Figure 2

```
{ Convert any text representing time to time values, }
{   in all selected cells. }
{ Format the cells as "hr:mn am" (this is time format 2). }
{ Written by James Finn, 8/8/89 }

DEFINE RANGENUM      { number of ranges in selection }
DEFINE THERANGE      { current range }
DEFINE FIRSTROW, FIRSTCOL { first row, column in current range }
DEFINE R, C          { current row number, column number }
DEFINE THECELL       { reference for current cell }

REPAINT OFF { for speed - don't redraw screen until the end }

FOR RANGENUM = 1 TO NRSELECTIONS() { for each selected object }
  IF SELECTIONTYPE(RANGENUM) = 1 { must be cell or range }
    THERANGE = SELECTION(RANGENUM)
    FIRSTROW = ROWOF(THERANGE)
    FIRSTCOL = COLOF(THERANGE)
    FOR R = FIRSTROW TO (FIRSTROW + ROWS(THERANGE) - 1)
      FOR C = FIRSTCOL TO (FIRSTCOL + COLS(THERANGE) - 1)
        THECELL = RANGE(MAKECELL(C, R))
        { only convert good times }
        IF NOT ISERR(TIMEVALUE(CELLTEXT(THECELL)))
          PUT TIMEVALUE(CELLTEXT(THECELL)) INTO THECELL
        END IF
      END FOR
    END FOR
  ELSE { give error message, saying which selection was bad }
    MESSAGE "Selection " & RANGENUM & " is not a cell or range"
  END IF
END FOR

FORMAT TIME 2 { format the cells as "hr:mn am" }

REPAINT ON { redraw the screen }
REPAINT WINDOW
```

Figure 2: This working Wingz script shows how easily you can extend the functionality of your software. Every selected cell containing text that represents time (such as "10:30am") is converted to a time value.

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time values into a Wingz spreadsheet.

Operating on Selections

Remember, a selection may contain multiple ranges, each of which is a rectangular block of cells. To access each cell in turn, you have to use the control structures available in HyperScript — in this case, that means using FOR loops. HyperScript's FOR loop is similar to those in other programming languages and is used to repeat an action a specific number of times. The loop uses a counting variable, called the *control variable*, that increases from an initial value to some final value. For example, the statement

```
FOR I = 1 TO 10
  whatever
END FOR
```

repeats the command *whatever* ten times, using *I* as the control variable.

FOR loops can be nested, and our template uses three nested loops. The outer loop steps through each range in the selection, counting

from 1 to the number of ranges that have been selected. The next loop steps through each row in a range, from the first to the last. The innermost loop steps through each column in a row, letting us process one cell at a time. The basic structure looks roughly like this:

```
FOR each range in the selection
  FOR each row R in the range
    FOR each column C in the row
      Do whatever with the cell in the row R, column C
```

Filling in some of the details gives:

```
FOR RANGENUM = 1 TO NRSELECTIONS()
  THERANGE = SELECTION(RANGENUM)
  FIRSTROW = ROWOF(THERANGE)
  FIRSTCOL = COLOF(THERANGE)
  FOR R = FIRSTROW TO (FIRSTROW + ROWS(THERANGE) - 1)
    FOR C = FIRSTCOL TO (FIRSTCOL + COLS(THERANGE) - 1)
      { do what you want to do with cell R,C }
    END FOR
  END FOR
END FOR
```

Here's some explanation: NRSELECTIONS() returns the number of ranges in the selection. RANGENUM is a control variable for the FOR

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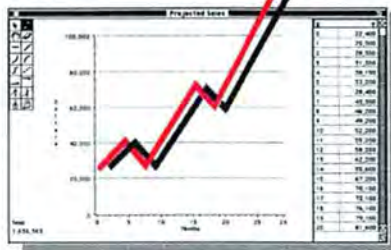
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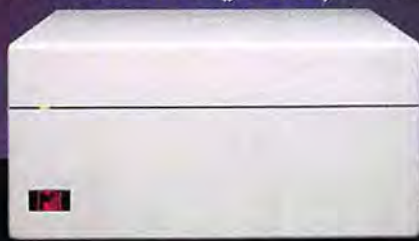
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POWER TOOLS

loop and steps through each of these ranges in turn. The next three lines set other variables to useful values.

Most HyperScript functions that work with ranges require a range reference as an argument. A range reference is the standard way to identify a range and looks something like B7..G12. SELECTION (RANGENUM) takes the range number RANGENUM and returns a range reference for that part of the selection (this feature of the SELECTION function is not documented in the Wingz manuals.) We assign this reference to the variable THERANGE.

The expressions ROWOF (THERANGE) and COLOF (THERANGE) return the number of the first row and first column, respectively, in the range. These values are assigned to the variables FIRSTROW and FIRSTCOL — they are needed for starting values of FOR loops.

We also need the final values for the FOR loops, which will be the numbers of the last row and column in the range, but HyperScript has no functions that provide these numbers directly. What it does have are the functions ROWS and COLS, which tell us how many rows and columns are in a range. Given these values, it's easy to calculate the last row and column numbers: If THERANGE starts in row FIRSTROW and contains ROWS (THERANGE) rows, then (FIRSTROW + ROWS (THERANGE) - 1) gives the number of the last row. Calculating the last column is similar. R and C are used as FOR-loop control variables in the inner loops, representing the current row number and column number.

Figure 1 shows the finished template. It adds some features to what we've done.

First, Wingz requires that all variables be declared, so the template begins with DEFINE statements.

Your scripts run faster if you don't refresh the screen until after all the cells have been processed. This is accomplished by the REPAINT OFF statement at the beginning of the script and the pair of statements REPAINT ON and REPAINT WINDOW at the end.

Last, we've added a bit of defensive programming to the template, anticipating possible user errors. We've been assuming that the selection contains only ranges, but a user might accidentally include a chart or some other object in the selection. The function SELECTIONTYPE returns the type of any part of the selection — a return value of 1 means it's a cell



or range. SELECTIONTYPE (RANGENUM) is used within an IF statement to check each part of the selection before it's processed—if it's not a range, we display an error message in a dialog box, using the MESSAGE function. The & symbol represents text concatenation and is used to create a message such as "Selection 3 is not a cell or range".

Now we're ready to use this model script to solve a real problem: working with time values in Wingz.

Time-Value Problem

Typing time values in Wingz can be a chore. If you enter "10:30am" in a cell, Wingz doesn't understand that this is supposed to represent a time, and it formats your entry as plain text. The Wingz manuals tell you to enter times by using the TIME function—in this example, you'd have to type "=TIME(10,30,00)", where the three arguments are the hours (based on, ugh, a 24-hour clock), minutes, and seconds of the desired time. This is no fun. Life would be simpler if you could type "10:30am" and then run a script to convert the text to a time value.

In "5 Ways to Extend Your Wingz" (PowerTools, December '89), we gave a short script that does this—it converts the text in the current cell to a time value and then formats the cell to use the HH:MM AM format. Here's the script:

```
PUT TIMEVALUE(CELL())
INTO RANGE(MAKECELL(COL(),
ROW()))
FORMAT TIME 2
```

This script, however, operates only on the active cell. It would be easier to enter several time strings into a worksheet, select the cells containing them, and convert the whole selection with a single command. We will modify the template of Figure 1 to create this script.

The Working Script

Figure 2 shows the script for fixing times. Let's look at all the changes we've made to the template. We've added one more variable, THECELL, to store a reference to the cell being changed. This reference is created by the statement THECELL = RANGE(MAKECELL(C, R)).

This is similar to the way we made a cell reference in the previous script, except that here we use the control variables C and R to reference the column and row numbers that change with each iteration of the inner FOR loops. TIMEVALUE needs the contents of the cell, which we can get

by using the CELLTEXT function. CELLTEXT (THECELL) returns the text contents of the referenced cell, and TIMEVALUE (CELLTEXT (THECELL)) gives the converted time value.

We've added another bit of defensive programming. Before converting a cell's contents to a time value, we first check that the cell contains a string that can represent a legal time. If a cell contains a formula or a string, using the TIMEVALUE function will cause an error. HyperScript provides several mechanisms for dealing with errors. Here, we use the ISERR function; if

```
TIMEVALUE (CELLTEXT (THECELL))
causes an error, then
ISERR (TIMEVALUE (CELLTEXT (THECELL)))
returns TRUE; otherwise it returns
FALSE. These statements check that
ISERR returns FALSE—meaning all is
well—before attempting to convert the
text string to a time value:
{ only convert good times }
IF NOT
ISERR (TIMEVALUE (CELLTEXT (THECELL)))
PUT TIMEVALUE (CELLTEXT
(THECELL)) INTO THECELL
END IF
```

Finally, the statement FORMAT TIME 2 has been placed outside all the FOR loops. FORMAT TIME applies to all selected cells, so it needs to be executed only once for the whole selection.

Putting It All Together

Before you can use the new script, you must enter it in Wingz: Select New Script from the Script menu, type in the script, and save it. You can then run it by selecting Run Script from the Script menu.

If you prefer, you can access this script by adding a new command to Wingz's Format menu, which is easiest if you use a startup script—if you create a script named Startup in the same folder as Wingz, it will run automatically each time you launch Wingz.

Suppose you saved the script of Figure 2 in the same folder with Wingz, using the filename Fixtimes Script. Add the following lines to your Startup script (or create one if you don't have one already):

```
SELECT MENU "Format"
ADD MENUITEM "Fix Times"
COMMAND
"RUN SCRIPT ""Fixtimes
Script"""
```

Happy scripting. You can use any of the techniques presented here in scripts that solve your own problems.

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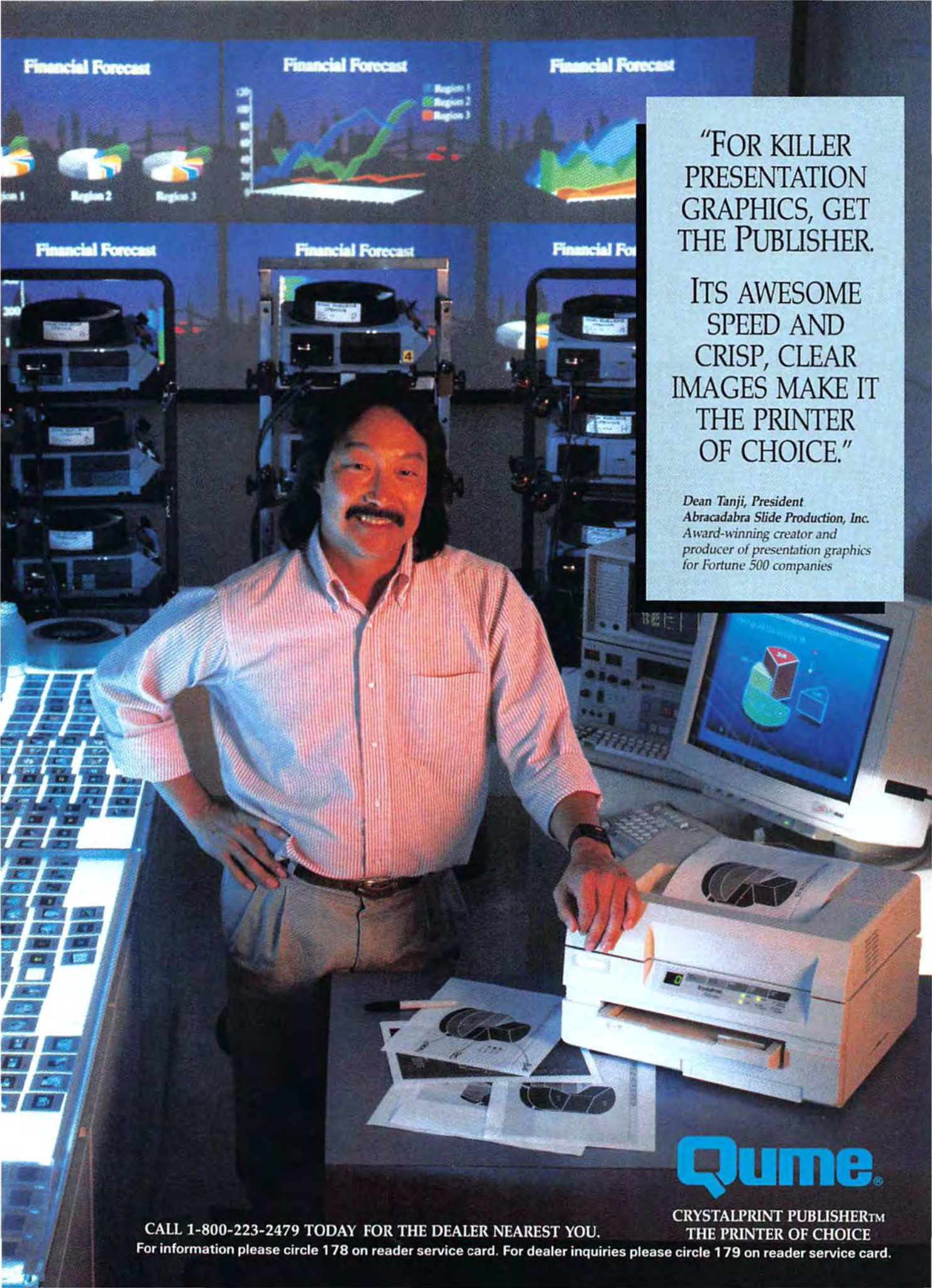
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Integrating the System

There is a system behind the System.

The operating system of the Macintosh is more than the file called System, more than the folder of the same name, and even more than the entire set of files in that folder and all the programs coded into ROM. It's all these things plus their ability to work together.

More than any single Startup document (INIT), Control Panel document (cdev), or System file, the integrated functioning of these tools defines the System. In fact, this integration is a tool by itself, and it is the tool most people, even those who use the individual tools well, don't use efficiently. The next release of the System software will be more integrated, but the real value comes in the integrated use of System tools by users. This requires learning to think about the System in new ways.

One good tool for developing an integrated approach to System tools is a macro utility. Macro utilities let you record sequences of keystrokes, mouse moves, and other actions to be played back later with a single keystroke that you assign. Last October, I suggested some ways in which you might want to use Apple's macro utility, MacroMaker. This month I'll suggest when not to use it, and take a look at how you can use some alternative third-party macro utilities to make your System more of a system.

Macro Misbehavior

MacroMaker is fine if it does what you want. It is easier to learn and is as easy to use as any of the alternatives, it performs its job as well as you could ask (as long as you don't run

By Michael Swaine

into incompatibilities), and it's free. It has some serious incompatibilities and limitations, however. It conflicts with many other products (Microsoft Works, for example). If you see signs of conflict (a new Startup document doesn't take effect, for instance), your first diagnostic step should be to take MacroMaker out of your System Folder and restart your Mac. Incompatibility with software that you need more than you need MacroMaker is the first reason to abandon the latter.

The second reason is to go beyond MacroMaker's limitations. MacroMaker is restricted

to recording keystrokes and the screen coordinates of mouse clicks. QuickKeys from CE Software lets you specify applications to open and define mouse clicks relative to the current document's window rather than just the screen coordinates. AutoMac III from Genesis Micro Software lets you edit macros with a textual language. Tempo II from Affinity Microsystems lets you create dialog boxes that present you with a choice when the macro is playing back. The macro will branch to one or another sequence of actions based on your choice. These capabilities make all these third-party macro utilities more powerful than MacroMaker.

If you conclude that MacroMaker is underpowered, you're right. But this doesn't necessarily mean you should avoid it. As I said in October, a good use for MacroMaker is for producing personal and ad hoc macros, which cost little to build. If you follow the strategy I outlined (don't correct trivial errors; don't edit; record

once; and if it works, use it), you can use MacroMaker to construct time-saving tools with a minimal time investment. If you have to discard those tools later, it will be a small loss, and the ad hoc macros will have served their purpose.

But you may decide to invest the time in building more-complex or more-timeless macros, developing integrated sets of macros that become a permanent part of the way your system operates. Using macros to build integrated structures that build on other System tools is the third reason to switch to a more reliable tool. Before you can use macros effectively in this way, though, you must learn to

MacroMaker: Some restrictions apply

1. What MacroMaker can do:



2. Signs that MacroMaker isn't enough:



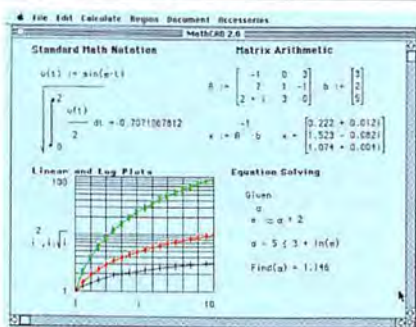
Figure 1: MacroMaker is perfect for the transfer of data such as the date and time between documents, but you'll need a third-party alternative if you run into compatibility problems, need to record more than keystrokes, or need to integrate System tools.

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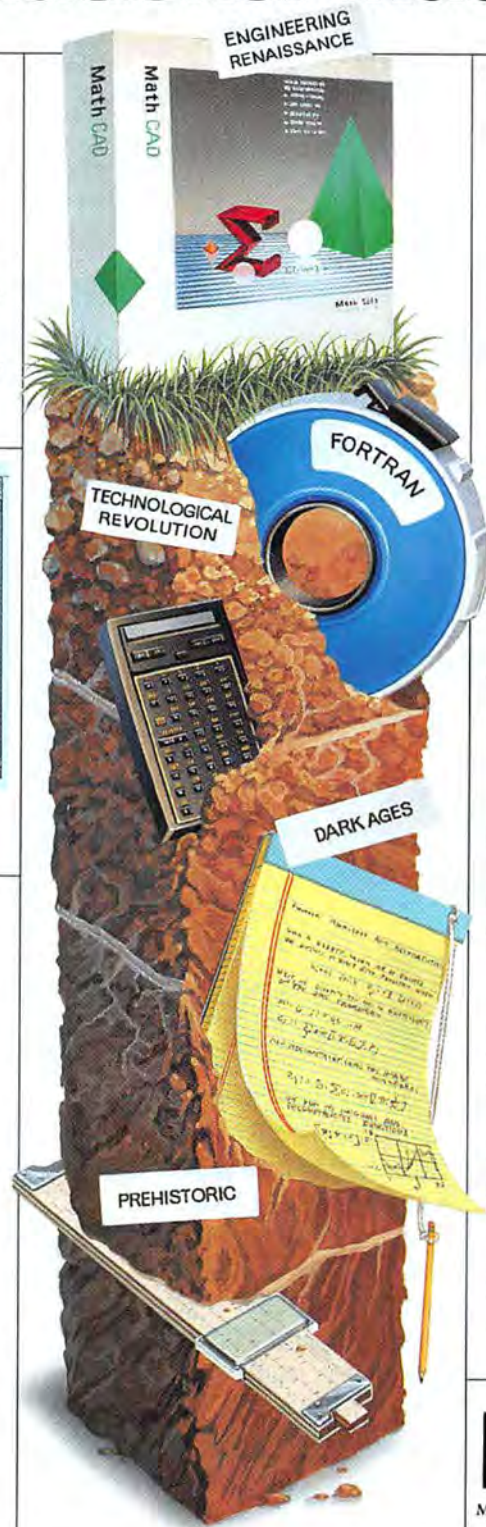


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take an integrated approach to the System.

The Clipboard Mind-Set

Making the System work as a system usually means shuttling data from place to place — the price of integration always involves some busing. The first step toward an integrated approach to System tools is to focus on the data to be moved rather than on the tool to be used. If you *think* of the Calculator DA and the Alarm Clock DA as a calculator and a clock, you'll tend to *use* them as a calculator and a clock, typing numbers into the one and reading the displays of both. But the Calculator is really a filter through which numeric data can be passed and altered in the passing. And the Alarm Clock is really a source of particular data: the current date and time. Thinking of them in this way will make it more natural to, say, integrate a calculation into a business letter or place a time-and-date stamp on a work of computer art.

This is just a matter of using the Clipboard. These operations date back to at least 1984 and can be performed on any Mac, but the mind-set they presuppose is not widely held. Practically everyone knows you can store pictures in the Scrapbook and notes in the Note Pad File. Most people may know that you can paste numbers into the Calculator DA, perform a calculation, and copy the result back to the initial location of the original number. They may also know that you can copy the time and date from the Alarm Clock DA. Many people may realize that the user name in the Chooser dialog box and the file or folder information in

the Get Info box are equally available for cutting and pasting. But few people fully exploit this simple cut-and-paste level of integration, because they are not in the habit of thinking in terms of moving data.

Here's a simple test of that mind-set. In the preceding paragraph, I refer to the "Note Pad File." I'd originally written *Note Pad*, but I wanted to get the name of the file right and MultiFinder was not active, so I couldn't just look at its icon. I highlighted the text *Note Pad* in my manuscript, copied it to the Clipboard, invoked the Find File DA, pasted the text, pressed Return to execute the find, and noted that the correct name of the file was Note Pad File. I'm not suggesting that this was a brilliant insight; in fact, I did it essentially without thinking. That's my point. The cut-and-paste action was more natural for me than retyping the text into the Find File window, but only because I have trained myself to think about the data I want to move before I invoke the tool.

Here's the test: Would you think of using this technique for checking the filename (or some other Clipboard-mediated technique), and if so, would you find it more efficient to paste the text than to retype it? Unless this kind of technique crosses your mind, and unless it seems perfectly natural to you, you haven't acquired the mind-set.

Systematic Macros

Why would you want to acquire this mind-set? First, because it will save you time. Second, because it will result in your doing things

Here's a test to see if you've developed the System-beaters' macro mind-set: When you need to find some data, which do you think of first — the data or the tool for finding it?

System-Minimizing Hints

Last month, I asked readers to send in their attempts to create a minimum System. There's no single solution to this puzzle, so I'm waiting for more reader responses before giving a definitive answer — but here's one hint: If you have a Mac II or SE, the standard System fonts (Chicago 12, Geneva 9 and 12, and Monaco 9) are duplicated in the System file and in ROM, so you can safely delete all the System fonts from your System file. You can do this with ResEdit, but be sure always to work on a copy of the System file.

Several readers sent in the same tip for organizing the System Folder (or any folder). The basic tip is to alphabetize the icons in a folder; select all the icons (Command-A); choose View by Name; drag the icons to the desktop; and without deselecting them, drag them back and select View by Icon (or Small Icon). The icons will be arranged in alphabetical order.

The tip can be generalized: You can arrange icons by size or by kind or, if you have a color

machine, by color. And you can record the sequence of steps as a macro so that you can clean up and arrange the icons in a folder with one keystroke.

Figure A shows a System Folder that was organized by this technique. Or was it? I'll award a Beat the System T-shirt for the best explanation I receive for the organization of this folder.



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Figure A



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POWER TOOLS

in ways that can usefully be automated via macros. A macro based on selecting text is more general than one based on typing specific characters. A macro that pastes your name and address at the insertion point in a document is the sort of simple macro for which MacroMaker is adequate. A macro that pastes whatever is on page 1 of the Note Pad File is a more general tool, and a set of eight macros that paste from each of the pages of the Note Pad File represents enough power to make it worth turning to a third-party macro utility.

The Note Pad File and Scrapbook File are convenient for storing text and graphics. You can keep your company logo in the Scrapbook File and your name and address in the Note Pad File and create macros for pasting them into documents. In cases in which you are prompted for a password, you can record a macro that lets you supply the password with one keystroke. (Because this defeats the purpose of the password, it may also be a foolish thing to do.) You can keep boilerplate elements of form letters in the Note Pad File (and visuals in the Scrapbook File) and paste them into word-processing documents independently of the particular word processor you're using. You can do any of these things by recording a macro with any of the macro utilities.

Once you've created each macro, you need to assign a key combination to invoke it. This is also a lesson in integration. It's important to choose key combinations carefully to avoid conflicts with those of other utilities and applications. At the Finder level, using both the Command and Option keys with another key generally keeps you out of trouble. But when you're in a complex application such as Word, this type of combination is often already taken.

The Control key is generally a safe modifier. If you build a set of related macros, the keystrokes used to invoke them should be related. For example, you might use Control-1 through Control-8 for pastes from the eight Note Pad pages and Control-Shift 1 through 9 for up to nine Scrapbook pages.

The crowning touch would be to tie all these pastes to a single keystroke, with a dialog box that pops up to ask which page you want to paste. (Unfortunately, MacroMaker, QuickKeys, and AutoMac III can't do this, although Tempo II, with its branching capability, can.) Go forth and integrate. 



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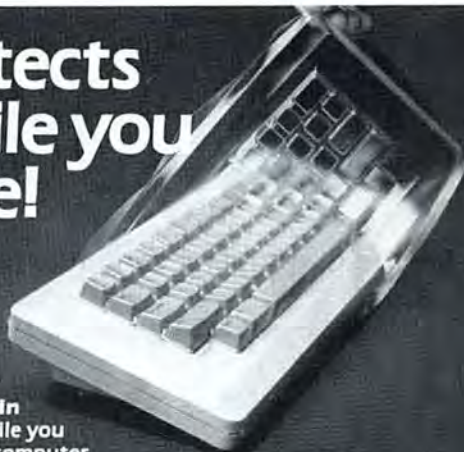
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Tip Sheet

Readers Share Their Tips and Tricks

Illustrator 88

QuarkXPress lets you place and print patterned artwork created in Illustrator 88 if you save the Illustrator document as an EPSF file. On the Illustrator end, you'll face a bottleneck, though: Saving a single art file in EPSF can take several minutes. And if you're saving, revising, and resaving several files at a time, you'll be waiting for eons.

Part of the problem stems from Illustrator's tendency to create and show a Mac Preview image in its Print dialog box. You can stop this by unchecking the Preview and Print Patterns option in Illustrator's Preferences menu. Now when you save in EPSF, there's no waiting. The image will print out correctly through QuarkXPress but won't appear on-screen.

Jeff White
Chicago, IL

Suitcase II

Sometimes you want to experiment with fonts other than those already loaded into your main suitcase file. Instead of loading each font individually into its own suitcase (time-consuming) or creating an all-encompassing suitcase with all your available fonts (more time-consuming), make a separate suitcase for a particular point size of all the fonts you may need. Although the screen representation may be less than clean, all your fonts will be readily available for selection.

Randy Zeitman
Malvern, PA

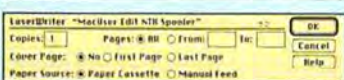
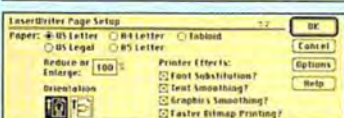
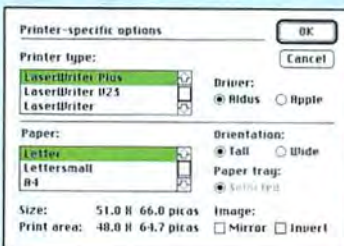
PageMaker

Switching from the Aldus printer driver to the Apple driver for background printing under MultiFinder is a hassle if you rely on the usual slow method of calling up the Aldus Print dialog box and selecting Change (see the resulting dialog box in Figure 1). This process is especially irksome if you have to switch back and forth several times during a session.

To bypass this snag:

PageMaker

Figures 1 and 2: In PageMaker, users must change printer drivers in order to have background printing under MultiFinder. You can manually switch from Aldus' printer driver to Apple Computer's by clicking on Change after selecting Print from the File menu (Figure 1 shows the resulting dialog box), but it's faster to switch it automatically: Hold down the Option key while selecting the Print option to give yourself a different dialog box (Figure 2).



1. Hold down the Option key while selecting Print from the File menu.

2. Click on OK in the two resulting dialog boxes (this takes two seconds).

3. Now you'll be at the familiar LaserWriter dialog box, where you can specify the number of copies and pages to print.

You've automatically switched drivers (see Figure 2).

M. Bernadette Goering
Minneapolis, MN

You may want your PageMaker publication to have a title page and then start the document with page 1, but PageMaker refuses to let you treat the first page differently from the rest. It also won't automatically number pages

starting with the second document page as page 1.

But if you put the title page at the end of the document and turn off the Display Master Items option on the Page menu for that page, you can use automatic page numbering for the document and still have a title page without a folio (see Figure 3).

Sue Hotovec
Johnston, IA

SuperPaint

To accurately eyeball the proportional resizing of rectangular objects in drawing programs such as MacDraw, SuperPaint, or Canvas:

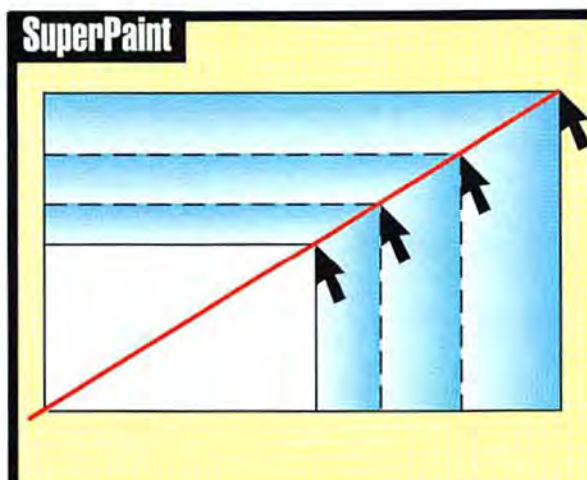
1. Draw a diagonal line from one corner of the object to the other, and extend it, keeping it lined up against the two handles.

2. Grab a corner handle at the end of the diagonal line and resize the object while



Figure 3: To get an unnumbered title page for a PageMaker document, put it at the end of the document and turn off the Display Master Items option on the Page menu for that page.

Compiled by Gregory Wasson



keeping the handle on that line.

3. Delete the line.

As long as the handle is on the diagonal line, the object is in proportion.

William Glass
Keene Valley, NY

Canvas 2.0

Although Canvas' multiple layers and overlay modes let you superimpose bit-mapped objects over other graphics, the rectangular frame around each bit map whites out everything below it, ruining the

desired effect. If you try to make the bit-mapped object transparent by using the Not Or option in the Ink Manager, the background will show through the white border but it'll also show through any white inside your object (see Figure 4).

You'll have better luck if you do the following:

1. Duplicate the bit-mapped object, and use the paint bucket to fill in the frame area of the duplicate with black. Be sure the outline of the picture is a continuous line so the paint won't overflow into the image itself. If the background is solid black (no patterns), you can skip the next three steps.

2. Use the Ink Manager controls near the bottom of the tool palette to change the object with the filled frame from Copy to the Not BIC

overlay mode. The object will be invisible unless it is in front of another graphic, so don't lose track of its position.

3. Select the original bit map with the unfilled frame and change its overlay mode to Or with the Ink Manager.

4. Select Bring to Front from the Object menu to bring the object to the front of the display.

5. Select both objects, place them exactly together with the Align command from the Object menu, and group them before clicking the mouse anywhere else.

When laid over another object, the frame is transparent but nothing shows through the interior of the picture (check Figure 4 again). Note that PostScript doesn't work with many QuickDraw overlay modes, so test printouts are mandatory with PostScript



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Canvas 2.0

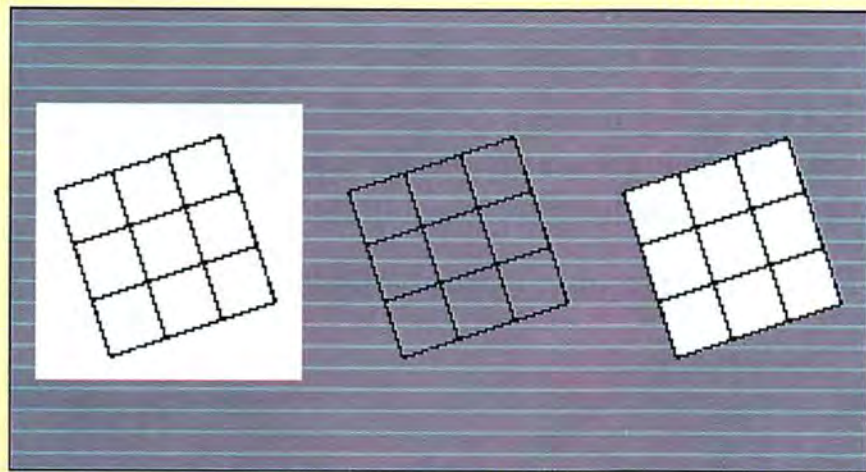


Figure 4: Overlaying bit maps on objects in Canvas ordinarily whites out any background underneath the frame (above). You can make the object transparent, but then the background shows through everywhere (top right). Using Canvas' Ink Manager along with some Option menu commands, you can overlay bit maps on objects and avoid disaster, getting a result that looks like the figure on the right.

or PostScript-compatible printers.

Pierce R. Butler
Gainesville, FL

If you're working with Canvas on a large-screen monitor with several windows open, using the Windows menu to switch between windows is a bother. An alternative is to Option-click anywhere in the title bar of a window except for the zoom or close boxes to get a list of all open windows (the same list is on the Windows menu).

Michael S. Taylor
Auburn, AL

LaserWriter

Turn your ordinary PostScript printer into a full-color PostScript printer with a little help from a color photocopy machine:

1. Create a color image,

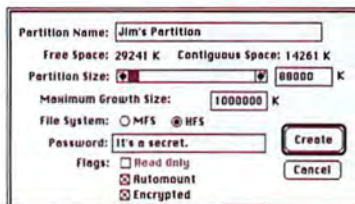
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PINNACLE MICRO

Tip of the Month

Canvas has a great undocumented search-and-replace feature.

1. Hold down the Option key while choosing Select All from the Edit menu.

2. Make a selection from the Pen Pattern, Fill Pattern, Foreground Color, Background Color, Pen Shape, Line, or Transfer Modes pop-up menu. Canvas will then select all the objects that have that attribute.

3. You can now choose any attributes (such as fill patterns) that you want, to globally replace the selected attribute.

Alison Moore-Smith and Samuel M. Smith
Provo, UT

using either Illustrator 88 or FreeHand.

2. Print cyan, magenta, yellow, and black (CMYK) separations of the image, using the color-separation utility of either program. You will end up with four black images printed on your LaserWriter — three will have the color information for each of the process colors (cyan, magenta, and yellow), and one will have the black information.

3. Set the color copier to cyan only, print the cyan separation, and put the printed cyan image back into the paper tray. Be sure you have the correct side up and that it is oriented in the proper direction.

4. Set the copier to magenta only and print the magenta separation onto the cyan image.

5. Continue in the same manner with the yellow and

black separations, each time carefully placing the printed image back into the paper tray until you have a full-color image.

Depending on which color copier you have, the image can be quite good. The most difficult part of printing color images in this manner is maintaining consistent registration of all four separations.

Thomas Hyatt
Baltimore, MD

Since the LaserWriter II's resolution is only 300 dpi, you can see a jaggedness at the edges of the type and graphics, especially on diagonal or curved edges.

If you set the LaserWriter's darkness control to the lightest setting and ask your printer (or copy shop) to shoot "on the light side," much of the jagged appearance washes

away and the print looks crisper — but remember that this is a compromise. If you set the printer too light, the type can change from bold to medium or medium to light. With a little care, however, you can get output that appears to be from a higher-quality printer than the one you've actually used.

Darryl Lewis
Lauderhill, FL

If envelopes tend to jam when you feed them manually into a LaserWriter, give them a slight downward curve by drawing them lengthwise across the edge of a table or desk first.

Another trick is to run your fingernail along the upper edge of the envelope to make it smoother.

Ralph Jerome
San Diego, CA

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Sang Chaul Shin: Software Engineer, Seoul, Korea
Business: Elex Computer, Inc.
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I like the Nisus word processor very much. Many others must like it too, because Nisus will be supplied with every new Macintosh sold in Korea.

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The macros and Easy Grep are especially good because Koreans like to have as many functions as possible. Another thing Koreans like is the graphic support. With MS Word, there was no support. Nisus puts graphics right in the text.

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Help Folder

Answers to Readers' Questions

Putting Fonts onto a LaserWriter Plus

Q. We have a LaserWriter Plus and recently bought several fonts. At the same time, we found ourselves with a spare external 20-megabyte hard disk. Is it

possible to use the hard disk to store the fonts and connect it to our printer?

Johnny Ordoveza
Daly City, CA

A. The only LaserWriter you can connect to a hard disk for font storage is the IINTX, because it's the only one with a built-in SCSI port for that purpose. With a LaserWriter Plus (or its current equivalent in Apple's product line, the LaserWriter IINT), your only

option besides waiting for fonts to download automatically each time you print is to manually download fonts to your printer's RAM and then leave the printer turned on.

Not Enough Finder Memory

Q. I have a Macintosh SE/30 using System 6.0.3. When MultiFinder is running, I have trouble opening disks that contain more than about 100 files and folders. I get the error message "There isn't enough Finder memory to work with the disk." I have no problem opening the same 1.44-megabyte disks

with MultiFinder turned off. Is there a way around this, short of reducing the number of files on my disks?

Steve Wellons
Charleston, WV

A. The Finder comes set with a MultiFinder partition size of 160K, which is sufficient for most Finder operations. If, on the other hand, you do a lot of copying or have disks with a large number of files on them, the Finder may run out of memory.

The way around this is to increase the Finder's MultiFinder partition size. To do this, locate the Finder in your System Folder. Do a Get Info

Times on an ImageWriter II

Q. I use MacWrite 4.6 and an ImageWriter II. I'm having a problem printing documents in the Times font: The printer occasionally prints a line without spaces between the words when there is an incomplete line in justified text. I haven't had the problem with any font other than Times. Can you suggest a cure besides switching word-processing software?

Michael Kimball
Albany, CA

A. Switching word processors (or at least upgrading) might not be a bad idea, but it won't solve your problem — the culprit is the Times font you got from Apple. Times is a laser font, meaning that it's intended to be used with LaserWriters, not ImageWriter IIs. Apple's New York screen font, which looks like Times, should reproduce better on an ImageWriter II. If you absolutely must have a font called Times, you should get it from a different source.

An ImageWriter II uses the 72-dpi bit map that's contained in the screen fonts installed in the System. If you have a modem and a CompuServe account, you can download screen fonts that include separate bit maps for each type style from the Adobe Forum data library. The complete set of Adobe screen fonts is there, free for the taking. Well, almost free — you'll have to pay the on-line charges. Downloading the Times screen fonts, for instance, takes almost 20 minutes at 1,200 bps.

If you don't have access to CompuServe or you don't have time to download all the fonts you want, another option is to buy screen fonts directly from Adobe. Many people don't realize that Adobe sells collections of screen fonts independent of its regular font packs. For \$50, you can buy screen fonts for the standard 35 fonts that ship with Apple (and most other) PostScript printers. For \$75, you can buy screen fonts for the complete Adobe type library.

For the best possible printing on an ImageWriter II, you might consider purchasing the Adobe Type Manager (ATM). It lets you print at the ImageWriter II's highest possible resolution with a much wider range of sizes (using ATM makes the most difference at larger point sizes) by giving your ImageWriter access to the font-outline information contained in printer fonts (for more about how ATM works, see "Hot Type: Rising Font Wars," December '89). ATM comes with four typefaces, including Times, for \$99.

Figure 1 shows a sample of what your printing looks like now and what it'd be like with the Adobe fonts or ATM.

stripped of its lettering and gilding),
shall not be lost, for it will (as he bel
more elegant edition, revised and c

torn out and stripped of its lettering and
work shall not be lost, for it will (as he
more elegant edition, revised and corre

cover of an old book, its contents torn out and
ood for worms; but the *work shall not be lost*,
a new and more elegant edition, revised and

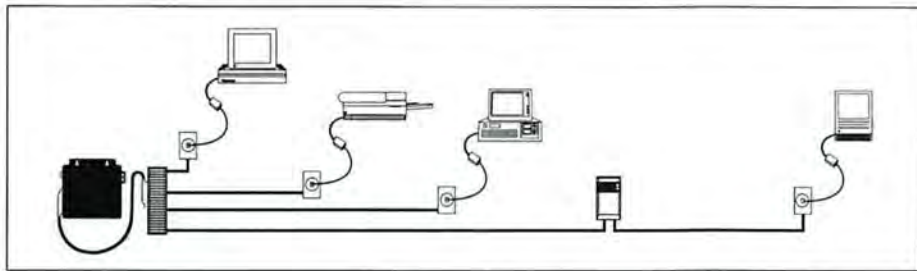
Figure 1: The quality of ImageWriter II printing depends heavily on font technology. The top sample was printed with Apple's 12-point Times font, which sacrifices aesthetics for legibility. The middle sample uses 12-point Adobe Times — notice the superior bold and italic. The bottom sample is in 12-point Adobe Times with ATM.

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(Command-I) on the file; in the lower right corner of the window, you will see a small box that contains the partition size. The default value is 160K. Change it to a larger value, and restart your Mac. If you then choose the About the Finder menu item on the Apple menu, you'll see that the Finder's partition has changed to the size you specified.

If the Finder still runs out of memory, experiment until you find a size that allows you to complete the Finder operations you normally perform. Be careful not to set the partition too large, though. Unlike an application, the Finder never quits under MultiFinder, so the memory allocated to the Finder is always in use, making it unavailable for use by other applications.

Upgrading a 512KE

Q. What are the options for upgrading my Macintosh 512KE? It seems that most software is now written for

machines with more memory, and I'm left out in the cold.

Christopher Bender
Mt. Pleasant, SC

A. You have several options, depending on what programs you want to run. You can soup up your 512KE with 4 megabytes of RAM, which is enough to run memory-hungry programs such as 4th Dimension, FullWrite Professional, Excel 2.2, and many graphics packages. If you don't use software that requires a lot of memory, you can comfortably run MultiFinder or HyperCard with 2 megabytes.

Your Apple dealer can install a 1-to-4-megabyte logic board and SCSI port for about \$600 (this upgrades you to a Mac Plus).

Among the third-party vendors offering upgrades is Dove Computer (1200 N. 23rd St., Wilmington, NC 28405; [919] 763-7918), which sells MacSnap upgrades (with or

without SCSI), which can take you to 1 or 2 megabytes of memory. An alternative is Brainstorm from MacDoctor Electronics (1145 Terra Bella Ave., Mountain View, CA 94043; [415] 964-2131), which you can install yourself and which allows you to upgrade to 1, 2, or 4 megabytes.

Whichever route you take, consider whether you are going to want to upgrade your upgrade. Some upgrades allow you to increase memory as well as eventually add on such things as accelerator boards or video-interface cards.

Disk Life Expectancy

Q. I read an interesting (and alarming) statement that the shelf life of a disk is two to three years at most. What is the source of this statement, and what is the best way to protect archival disks?

Paul Leinbach
Winter Park, FL

A. The statement's probable source is personal experience: Most of what is written about this subject is confined to exhortations to back up your disks at least once a day. The bottom line is that magnetic media deteriorate over time. The length of time depends on several environmental factors.

You can make your disks' home life as healthy as possible by taking some common-sense precautions: Store disks out of direct sunlight and away from magnetic fields such as your stereo speakers, your phone, a fluorescent light, or a computer screen. In addition, stack your disks to keep them from warping, and avoid extremes of temperature and humidity. Another safeguard is to copy your archival data onto new disks every two years or so.

PostScript Text Files

Q. In MacUser's roundup of PostScript printers ("Fit to Print," September '89), it

Clean Disks

Last September, a reader wrote that he had been unable to discover a cleaner that would remove the sticky residue left by old, out-of-date disk labels. The official Help Folder answer was to pile labels on top of one another a few times and then pull as much of them off as you can before starting

all over again. Several readers, though, found that approach too messy for their taste and sent in their own techniques. If you absolutely must have a glueless disk, you can try these methods at your own risk — just don't blame us if you melt your disk or set your house on fire.



Slightly moisten a very small area of a clean absorbent cloth with the lubricant WD-40. Gently rub the sticky area of the disk, taking care that no moisture enters the edge seam. Within seconds, the disk is clean and free from the glue residue.

Clyde W. Stolp
Carlsbad, CA



Quite by accident, I found that rubber-cement thinner works every time.

Carol A. Hill
Duluth, GA



Nothing can even come close to lighter fluid for removing adhesives. For less than a buck, you can get a supply that, depending on your age, may very well survive you.

Bob Krueger
San Diego, CA



I use a cleaner called OOPS! (New York Bronze Powder Co., Elizabeth, New Jersey). I bought mine in a one-pint can for about \$5. Although advertised as a remover of dried latex paint, it does an outstanding job of removing adhesive residue, and there's no damage to the disk.

Bob Doehrmann
Huntsville, AL



Judicious use of a hair drier softens the adhesive on even permanent labels and allow you to easily peel them off. Then a little lighter fluid on a cotton ball or paper towel removes all remaining traces of the adhesive.

Jim Thwaites
Tulsa, OK



became apparent that the clone printers were by far the best buys of the lot. The authors did warn of two problems: The clones take a long time downloading non-resident fonts, and they don't work with Adobe's Type 1 fonts, in which most service bureaus have invested heavily.

But isn't it true that you can send any PostScript file to a service bureau, regardless of what fonts that bureau has in-house, simply by using PageMaker's Command-F feature to print an ASCII PostScript text version of your file to disk? Granted, this can result in some enormous text files, but several thousand typefaces are lurking about in the world, and only a small fraction of them are available

from Adobe. Why limit yourself?

**Craig Federhen
Kingston, NH**

A. First of all, now that Adobe has announced that it will publish the specifications for its Type 1 fonts, we can look forward to an era of PostScript-clone printers that print those fonts as easily as any others. That said, there are a couple of disadvantages to printing your PageMaker document to disk and sending it to a service bureau. As you noted, if your document uses a lot of fonts besides the standard 35 resident LaserWriter fonts, the PostScript text file that you create will be substantially bigger than the original PageMaker file. By relying on the service bureau to provide the font information, you save a lot of space. And

what if something goes wrong when you get your file to the service bureau? If the service bureau has only your PostScript text file, it will find it next to impossible to troubleshoot your job.


The font market is in the middle of some major upheavals right now, so most service bureaus may start to carry fonts from more than one supplier. In the meantime, Adobe remains the dominant standard.

Hard-Disk Repairs

Q. Nine months after I bought a Mac SE with a 20-megabyte hard drive, the hard drive failed. When I took my Mac back to where I'd bought it, the service technician told me that my Mac would need a new hard drive (at a cost of \$650). When I picked up my Mac

after the hard drive was replaced, all the information that was on the hard drive I took in was on the new hard disk. Is it possible to transfer from a damaged hard disk to a serviceable disk, or did I get ripped off?

**Alan S. Lewis
San Bernardino, CA**

A. Yes, it's possible to transfer data from a damaged hard disk. What your experience most likely means is that the technician went beyond the call of duty by salvaging the data from your damaged disk. If your concern is that the drive was not replaced, you are perfectly within your rights to ask your dealer for the paperwork documenting the repair, which should give you the old and the new drives' serial numbers and prove that a new drive was installed. 

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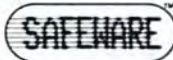
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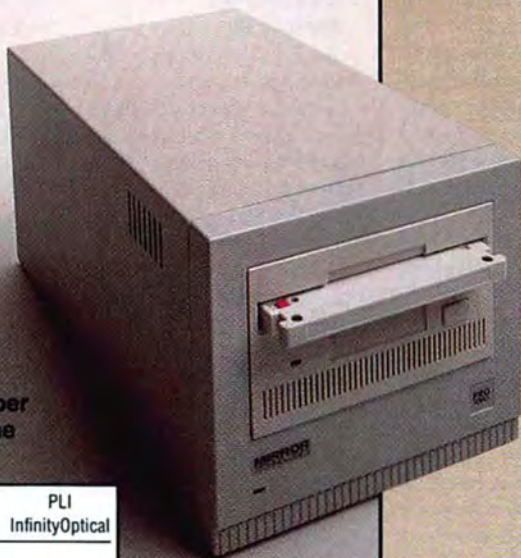
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Don't you just hate the way font menus look once you've installed a lot of typefaces? So do I!

Font Woes

The system engineers who gave the Mac the ability to display different typefaces, styles, and point sizes had tremendous vision. They also had myopia. Their mission was to display fancy font work on the screen and to print it

on the ImageWriter. This was a tremendous achievement for its time. But they never imagined that some day Macs would be front ends to high-resolution typesetting machines. (At least I hope they didn't imagine it; surely no one would *consciously* create the mess I'm about to describe.)

The Font Manager (the part of the Macintosh operating system that controls how text is displayed) was designed to let you choose among italic, bold, condensed, expanded, outline, shadow, and underline styles. This made for some flashy screen displays that wowed users in the early days of the Mac. It was fine for fonts such as Geneva, New York, and Venice. But when Apple released the LaserWriter, it opened the door to the lush world of typography.

Working with Weights

From a typographer's point of view, the Mac's set of styles doesn't make much sense. Glomming the seven font modifiers together into a single Style menu causes more problems than it solves. Outline and shadow have no equivalent in the typographic world. Condensed and expanded are more meaningful entities, but I can't think of a single Mac application that actually uses these style attributes to select the appropriate PostScript fonts at print time.

Even with bold and italic, Apple's approach creates confusion. Italic is straightforward. A typeface is either italic or it's not — a simple either/or choice. But bold cannot be handled quite so easily. Bold and roman (plain) are only two of many *weights* (or thicknesses) that type can have. A font's weight can be thin, light, roman, medium, bold, black, or ultra — and that's not even a complete list.

A *family* is a group of fonts that share a similar basic design. One of the Mac's greatest

shortcomings is how poorly it deals with typeface families that, rather than having only two weights (roman and bold), have three, four, five, or more. Futura and ITC Serif Gothic, for example, have six each. Adobe's Helvetica Neue family has eight. In fact, more than half the type packages in the Adobe Type Library are part of families with three or more weights. Typically, *each weight* has both italic and nonitalic faces.

The Font Manager doesn't handle this richness very elegantly. It simply wasn't designed for the job. It handles italic just fine because there are only two choices. But in the description of a Macintosh font, there is only a single bit, the "bold" bit, that can be used to indicate the weight of a font. It's either on (bold) or off (not bold). So within a single type family, no matter how many weights the family includes, the Macintosh *can't* keep track of more than two at a time.

The result: interminable Font menus in which each styled face appears separately. Worse, rather than all the styles in a family appearing together, they are scattered all over the place (see Figure 1). For example, B Bodoni Bold is alphabetized under *B*, while I Bodoni Italic is listed under *I*. This is intuitive? Give me a break. To be fair, this latter annoyance is as much the fault of Adobe and Microsoft as it is of Apple. Adobe invented this user-hostile approach to screen fonts partly as a workaround for the non-standard Font menu in early versions of Microsoft Word. The menu was so narrow that if an indication of the font's style wasn't listed first, it would be cut off and users couldn't tell one font from another.

Apple Throws Us a Bone

NFNTs, relatively new Macintosh font resources, are supposed to alleviate this problem. (Adobe is now supplying all its screen fonts in NFNT form.) A Mac font family typically consists of four fonts: two weights (roman and bold), each with an italic and nonitalic version. Each font style has its own NFNT, and you can

Font

2Stone Sans
 Avant Garde
 B 2Stone Sans Bold
 B Avant Garde Demi
 B Bodoni Bold
 B Clearface Bold
 B Helvetica Bold
 B Palatino Bold
 BI 2Stone Sans BoldItalic
 BI Avant Garde DemiOblique
 BI Bodoni BoldItalic
 BI Clearface BoldItalic
 BI Helvetica BoldOblique
 BI Palatino BoldItalic
 Bk Clearface Black
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 Bodoni
 Chicago
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 Eras Bold
 Eras Book
 Eras Demi
 Eras Light
 Eras Medium
 Eras Ultra
 Geneva
 H Clearface Heavy
 ✓Helvetica
 HI Clearface HeavyItalic
 I 2Stone Sans Italic
 I Avant Garde BookOblique
 I Bodoni Italic
 I Clearface RegularItalic
 I Helvetica Oblique
 I Palatino Italic
 L Helvetica Light
 LB Helvetica Black
 LBI Helvetica Black Oblique
 LI Helvetica Light Oblique
 Monaco
 P Bodoni Poster
 Palatino
 Sb 2Stone Sans Semibold
 SBI 2Stone Sans SemiboldItalic

Figure 1: This is a typical Macintosh Font menu prior to merging NFNT screen fonts. Font family members are sprinkled everywhere. Standards such as these cry out to be violated.

By Henry Bortman

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merge the NFNTs in a Mac font family so that only family names (Bodoni, Garamond) remain on the Font menu. The nonroman style names disappear. They are still accessible, but only via the Style menu. For example, if you

One of the Mac's main shortcomings is how poorly it deals with typeface families.

merge the NFNTs for the Times family, only Times remains on the font menu. B Times Bold, BI Times Bold Italic, and I Times Italic simply vanish. This scheme works quite well for *simple* families — those that contain nothing other than roman (plain), italic, bold, and bold-italic typefaces (or some subset thereof). For these families, merging the NFNTs eliminates font-family scatter and cuts the Font menu down to as little as one-fourth of its premerged size (compare the Avant Garde family in Figures 1 and 2). This is particularly useful if you have a large type library. If you install all the fonts in the first 85 packages of the Adobe Type Library (some 400 typefaces) and don't merge them, the Mac cannot display them all. The Font menu just poops out somewhere around the italics, leaving any font that starts with the letters J through Z inaccessible. Word 4.0 is particularly uncooperative under these conditions — it won't even launch properly unless you first customize its Font menu.

Unfortunately, in the world of typography, type often comes in *complex* families — those with more than two weights — and merging styles in a complex family doesn't work very well on the Mac. Even if you merge NFNTs, your Font menu is *still* a mess. There's absolutely nothing you can do to eliminate this problem completely, given the current design of the Mac's Font Manager. Mac font families can contain only two weights, period.

Helvetica, for example, has four weights: Light, Plain, Bold, and Black. (There are actually two different Helvetica families in the Adobe Type Library, one with four weights and one with eight. I'm talking about the four-weighter.) Without Light and Black, Helvetica is a simple family. If you merge the basic set of Helvetica Plain, Oblique, Bold, and Bold-Oblique NFNTs and then select Helvetica from the Font menu and Bold from the Style menu, you get Helvetica Bold — piece of cake.

But suppose you add the Helvetica Light and Black NFNTs to your System and merge

them. What shows up on the Font menu? Helvetica's still there, but now so is L Helvetica Light (see Figure 2). You thought you were going to get rid of that nasty L, didn't you? And what do you do if you want Helvetica Black? Why, you select L Helvetica Light from the Font menu and Bold from the Style menu. Makes a lot of sense, doesn't it?

What you'd really like to do is to get *just* Helvetica to appear on the Font menu and select *any* of the four possible weights from the Style menu. But you can't. (For the technically obsessive, the Font Manager can handle only two weights per Mac font family, so you're actually getting *two* Mac families, each with two weights.)

How do you go about merging NFNTs? You can use Font Harmony (a utility that comes with Suitcase), Font/DA Utility (part of MasterJuggler), or FONTastic Plus (a bit-mapped-font editor from Altsys). These utilities also can convert FONT resources, the old resources for screen fonts, to the newer NFNTs. (For more information on font resources and font management, see "Fonts by Number," July '89.)

The Hobgoblin of Little Minds

The relationships among fonts in Mac type families are called *style links*. We could live more easily with the Mac's shortcomings if the style links for all complex families worked the same way. But they don't. Clearface, for example, also has four weights: Regular, Bold, Heavy, and Black. If this family followed the Helvetica pattern, Regular (font) plus Bold (style) would give you Black. But no. If you merge all the NFNTs in the Clearface family and then apply a Bold style to Clearface Regular, you get Clearface Heavy. The Stone families work in yet another way. Eras in another. Bodoni in still another. (If this doesn't make sense, try reading it while referring to the style-link information in Table 1.)

I could go on listing examples. But suffice it to say that the rules are "customized" (to put it politely) for each complex family. Until you merge the fonts in a complex family, there's no way to tell which names will remain on the Font menu and which will disappear. And then you can't tell which of the remaining fonts you should apply the Bold style to in order to access the fonts that are no longer there. You either have to memorize how each family works or

Font

2Stone Sans
Avant Garde
B 2Stone Sans Bold
B Clearface Bold
Bodoni
Chicago
Clearface Regular
Eras Book
Eras Demi
Eras Light
Eras Medium
Eras Ultra
Geneva
✓Helvetica
L Helvetica Light
Monaco
P Bodoni Poster
Palatino

Figure 2: After merging the screen fonts in Figure 1, the Font menu is considerably more intelligible. Simple families such as Palatino and Avant Garde are reduced to a single entry. However, complex families such as Clearface, Bodoni, Helvetica, and Stone Sans don't fare as well. Note that five of the six weights in the Eras family still remain.

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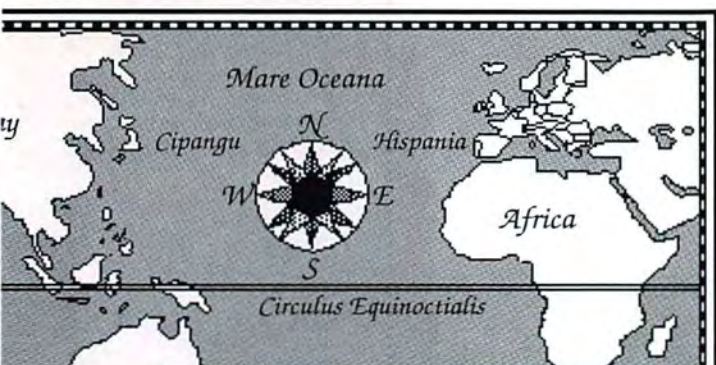
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Table 1: Style Links in the Adobe Type Library

Here are all the fonts in packages 1 through 85 of the Adobe Type Library. Screenfont names are shown instead of printer fonts, and the fonts are grouped alphabetically by family (in order of increasing weight) rather than by package or in the order they appear on the Font menu. If you merge styles, the names shown in heavy type will remain on the Font menu and those in lighter type will disappear. The arrows show style links among different weights — what you get if you select a font listed in heavy type and apply a bold style to it. Italic links (not shown) tend to mirror the links for the nonitalic styles of similar weight.

B Aachen Bold

American Typewriter
B American Typewriter Bold

Americana
I Americana Italic
B Americana Bold
XB Americana ExtraBold

L AntiqueOlive Light
R AntiqueOlive Roman
I AntiqueOlive Italic
B AntiqueOlive Bold
Blk AntiqueOlive Black

Avant Garde
I Avant Garde BookOblique
B Avant Garde Demi
BI Avant Garde DemiOblique

L Avenir Light
LO Avenir LightOblique
Bk Avenir Book
BkO Avenir BookOblique

R Avenir Roman
O Avenir Oblique
M Avenir Medium
MO Avenir MediumOblique
H Avenir Heavy
HO Avenir HeavyOblique
BI Avenir Black
BIO Avenir BlackOblique

L Belwe Light
M Belwe Medium
B Belwe Bold

C Belwe Condensed

Benguiat
B Benguiat Bold

Bodoni
I Bodoni Italic
B Bodoni Bold
BI Bodoni BoldItalic
P Bodoni Poster

Bookman
I Bookman LightItalic
B Bookman Demi
BI Bookman Demilight

Brush Script

Carta

Caslon 3 Roman
I Caslon 3 Italic

Caslon 540 Roman
I Caslon 540 Italic

CaslonOpenFace

L Centennial Light
LI Centennial LightItalic
Centennial
I Centennial Italic
B Centennial Bold
BI Centennial BoldItalic
Blk Centennial Black
BIK Centennial BlackItalic

E CenturyExpanded
EI CenturyExpanded Italic

Century Old Style
I Century Old Style Italic
B Century Old Style Bold

Cheltenham
I Cheltenham BookItalic
B Cheltenham Bold
BI Cheltenham BoldItalic

L Clarendon Light
Clarendon
B Clarendon Bold

Clearface Regular
I Clearface RegularItalic
B Clearface Bold
BI Clearface BoldItalic
H Clearface Heavy
HI Clearface HeavyItalic
Blk Clearface Black
BIK Clearface BlackItalic

R Concorde Roman
I Concorde Italic
B Concorde Bold
BI Concorde BoldItalic

Cooper Black
I Cooper Black Italic

Corona
I Corona Italic
B Corona Bold

Courier
I Courier Oblique
B Courier Bold
BI Courier BoldOblique

Eras Light
Eras Book
Eras Medium
Eras Demi
Eras Bold
Eras Ultra

Eurostile
O Eurostile Oblique
D Eurostile Demi
DO Eurostile DemiOblique
B Eurostile Bold
BO Eurostile BoldOblique

Excelsior
I Excelsior Italic
B Excelsior Bold

FranklinGothic
I Franklin Gothic BookOblique
B Franklin Gothic Demi
BI Franklin Gothic DemiOblique
H Franklin Gothic Heavy
HI Franklin Gothic HeavyOblique

Freestyle Script

Friz Quadrata
B Friz Quadrata Bold

L Frutiger Light
LI Frutiger LightItalic
R Frutiger Roman
I Frutiger Italic
B Frutiger Bold
BI Frutiger BoldItalic
BL Frutiger Black
BLI Frutiger BlackItalic
UB Frutiger UltraBlack

L Futura Light
LO Futura LightOblique
Futura Book
O Futura BookOblique
Futura
O Futura Oblique
B Futura Bold
BO Futura BoldOblique
H Futura Heavy
HO Futura HeavyOblique
XB Futura ExtraBold
XBO Futura ExtraBoldOblique

CL Futura CondensedLight
CLO Futura CondLightOblique

C Futura Condensed
CO Futura CondensedOblique
CB Futura CondensedBold
CBO Futura CondBoldOblique
CXB Futura CondExtraBold
CXBO Futura CondExtraBoldOblique

Galliard
I Galliard Italic
B Galliard Bold
BI Galliard BoldItalic

Garamond
I Garamond LightItalic
B Garamond Bold
BI Garamond BoldItalic

Garamond 3
I Garamond 3 Italic
B Garamond 3 Bold
BI Garamond 3 BoldItalic

R StempelGaramond Roman
I StempelGaramond Italic
B StempelGaramond Bold
BI StempelGaramond BoldItalic

Glypha
I Glypha Oblique
B Glypha Bold
BI Glypha BoldOblique

Gothic 13

Goudy
I Goudy Italic
B Goudy Bold
BI Goudy BoldItalic
H Goudy Heavyface
HI Goudy HeavyfaceItalic
XB Goudy ExtraBold

L Helvetica Light
LI Helvetica LightOblique
Helvetica
I Helvetica Oblique
B Helvetica Bold
BI Helvetica BoldOblique
LB Helvetica Black
LBI Helvetica Black Oblique

HelveCompressed
HelveExtCompressed
HelveUltCompressed

CL Helvetica Condensed Light
CLI Helvetica Condensed LightObli
C Helvetica Condensed
CI Helvetica Condensed Oblique
CB Helvetica Condensed Bold
CBI Helvetica Condensed BoldObli
CLB Helvetica Condensed Black
CLBI Helvetica Condensed BlackObli

N Helvetica Narrow

NI Helvetica Narrow Oblique
NB Helvetica Narrow Bold
NBI Helvetica Narrow BoldObli

25 Helvetica UltraLight

26 Helvetica UltraLightItalic

35 Helvetica Thin

36 Helvetica ThinItalic

45 Helvetica Light

46 Helvetica LightItalic

55 Helvetica Roman

56 Helvetica Italic

65 Helvetica Medium

66 Helvetica MediumItalic

75 Helvetica Bold

76 Helvetica BoldItalic

85 Helvetica Heavy

86 Helvetica HeavyItalic

95 Helvetica Black

96 Helvetica BlackItalic

Hobo

Bk Italia Book

M Italia Medium
B Italia Bold

Janson Text

I Janson Text Italic
B Janson Text Bold
BI Janson Text Bold Italic

Bk ITCKabel Book

M ITCKabel Medium
D ITCKabel Demi
B ITCKabel Bold
U ITCKabel Ultra

Kaufmann

B Kaufmann Bold

Korinna

I Korinna KursivRegular
B Korinna Bold
BI Korinna KursivBold

Letter Gothic

I Letter Gothic Slanted
B Letter Gothic Bold
BI Letter Gothic BoldSlanted

R Life Roman

I Life Italic
B Life Bold

Lubalin Graph

I Lubalin Graph BookOblique
B Lubalin Graph Demi
BI Lubalin Graph DemiOblique

Lucida

I Lucida Italic
B Lucida Bold
BI Lucida BoldItalic

LucidaSans Roman

I LucidaSans Italic
B LucidaSans Bold
BI LucidaSans BoldItalic

Machine

Melior

I Melior Italic
B Melior Bold
BI Melior BoldItalic

L Memphis Light

LI Memphis LightItalic

M Memphis Medium

MI Memphis MediumItalic
B Memphis Bold
BI Memphis BoldItalic
XB Memphis ExtraBold

MICR

New Baskerville

I New Baskerville Italic
B New Baskerville Bold
BI New Baskerville BoldIt

New Caledonia

I New Caledonia Italic
SB New Caledonia SemiBold
SBI New Caledonia SemiBold Italic
B New Caledonia Bold
BI New Caledonia BoldItalic
Blk New Caledonia Black
BIK New Caledonia BlackItalic

New Century Schlbk

I New Century Schlbk Italic
B New Century Schlbk Bold
BI New Century Schlbk BoldIt

News Gothic

I News Gothic Oblique
B News Gothic Bold
BI News Gothic BoldOblique

OCRA

OCRB

Optima

I Optima Oblique
B Optima Bold
BI Optima BoldOblique

Orator

I Orator Slanted

Palatino

I Palatino Italic
B Palatino Bold
BI Palatino BoldItalic

Park Avenue

L Peignot Light

D Peignot Demi

B Peignot Bold

Prestige Elite

I Prestige Elite Slanted
B Prestige Elite Bold
BI Prestige Elite BoldSlanted

Revue

L Serif Gothic Light

Serif Gothic

B Serif Gothic Bold
H Serif Gothic Heavy
Blk Serif Gothic Black
XB Serif Gothic ExtraBold

L Serifa Light

LI Serifa LightItalic

Serifa Roman

I Serifa Italic
B Serifa Bold
Blk Serifa Black

Sonata

Souvenir

I Souvenir LightItalic
B Souvenir Demi
BI Souvenir Demitalic

Stencil

3Stone Informal

I 3Stone Informal Italic
Sb 3Stone Informal Semibold
Sbl 3Stone Informal SemboldIt
B 3Stone Informal Bold
BI 3Stone Informal BoldItalic

2Stone Sans

I 2Stone Sans Italic
Sb 2Stone Sans Semibold
Sbl 2Stone Sans SemiboldIt
B 2Stone Sans Bold
BI 2Stone Sans BoldItalic

1Stone Serif

I 1Stone Serif Italic
Sb 1Stone Serif Semibold
Sbl 1Stone Serif SemiboldIt
B 1Stone Serif Bold
BI 1Stone Serif BoldItalic

Symbol

HC Tempo HeavyCondensed
HCI Tempo HeavyCondensedItalic

Tiffany

I Tiffany Italic
B Tiffany Demi
BI Tiffany Demitalic
H Tiffany Heavy
HI Tiffany HeavyItalic

Times

I Times Italic
B Times Bold
BI Times BoldItalic

TimesTen Roman

I TimesTen Italic
B TimesTen Bold
BI TimesTen BoldItalic

Trump Mediaeval

I Trump Mediaeval Italic
B Trump Mediaeval Bold
BI Trump Mediaeval BoldIt

L Univers 45 Light

LO Univers 45 LightOblique

Univers 55

O Univers 55 Oblique
B Univers 65 Bold
BO Univers 65 BoldOblique
Blk Univers 75
BlkO Univers 75 BlackOblique

CL Univers 47 CondensedLight

CLO Univers 47 CondLightObli
C Univers 57 Condensed
CO Univers 57 CondOblique
CB Univers 67 CondensedBold
CBO Univers 67 CondBoldObli

Univ GreekwMathPi

Univ NewswCommPi

University Roman

R Walbaum Roman

I Walbaum Italic
B Walbaum Bold
BI Walbaum BoldItalic

Weiss

Weiss Italic
Weiss Bold
Weiss ExtraBold

Zapf Chancery

Zapf Dingbats



Figure 3: Illustrator displays PostScript printer-font names rather than screen-font names. The Illustrator font list is long but logically organized, making it easy to access the desired font. (The program actually displays only four font names at a time; this image is doctored.)

keep a cheat sheet near your Mac.

What is Adobe's official position on this state of affairs? A spokesperson said the company considered using a consistent set of style relationships across all the families in its type library but rejected the idea. Instead, Adobe designers made their decisions on style links based on "aesthetic" considerations. That's a direct quote. Too bad they didn't publish a users' guide to Adobe aesthetics, since their choices are counterintuitive. Fortunately for you, Table 1 is just such a guide.

The Light at the End of the Menu

In an effort to overcome these problems, a few software developers have dared to violate the standard Macintosh interface. In general, I advocate strict adherence to standards, but I have to side with the heretics here. Interestingly enough, Adobe was the first company to stray from the path, with its Illustrator program. Its developers did away with the traditional dual Font and Style menus, which are based on *screen* font names, and provided a single menu based on PostScript *printer* font names (see Figure 3).

This still makes for a long font list, but at least all the styles in a family — even the most complex families — are grouped. Thus, it's much easier to find the typeface you're looking for and to know exactly what you're getting when you make a selection.

Smart Art, a DA from Emerald City Software that does PostScript type effects, goes Illustrator one better. It retains the Font and Style menus familiar to Mac users but implements them in a nonstandard — and much-improved — way. In Smart Art, the Font menu is renamed Family. It displays a single name

PRESERVATION PLAN ON IT

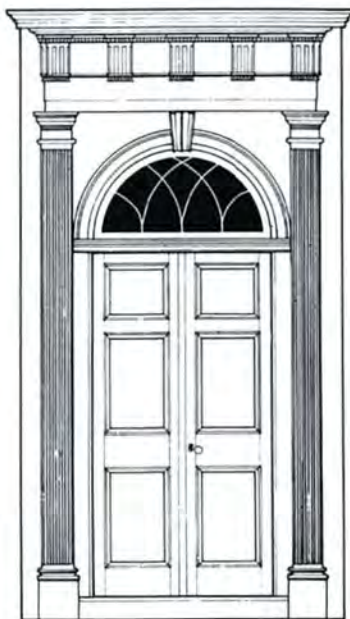
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for each typographic family, regardless of the number of weights or styles.

When you select a family, the Style menu displays a list of all the styles available for that family (see Figure 4). The term *user-friendly* comes to mind.

Emerald City did a bunch of fancy programming to work around the limitations of the Mac's Font Manager. I congratulate the company for showing the Mac community a more rational approach to font access. Too bad it works only in Smart Art.

The Mac's handling of typeface selection is one of the most glaring examples of an interface that has outgrown its original design. The Font Manager is long overdue for an overhaul. *NFNTs do not solve the problem.* If Apple were smart, it would learn from Emerald City and use the Smart Art concept as a springboard for a redesign. Unfortunately, Apple has announced that although System 7.0 will include new outline-font technology for Mac screens and non-PostScript printers, it will *not* fix the font-family funk. That's a real shame. I can understand how Apple got into this mess. But now it's time to clean it up. ☹



Figure 4: Emerald City's Smart Art uses custom programming to create an easy-to-use font menu. You select true family names from the Family menu. All the weights and styles for a selected family appear together on the Style menu.

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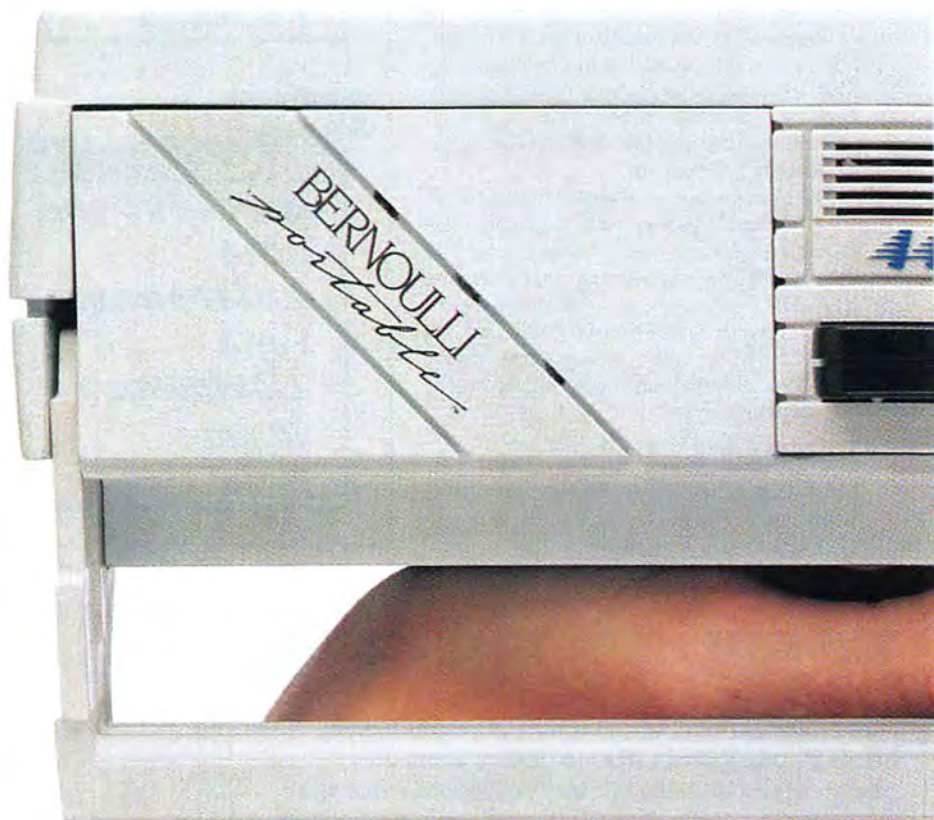


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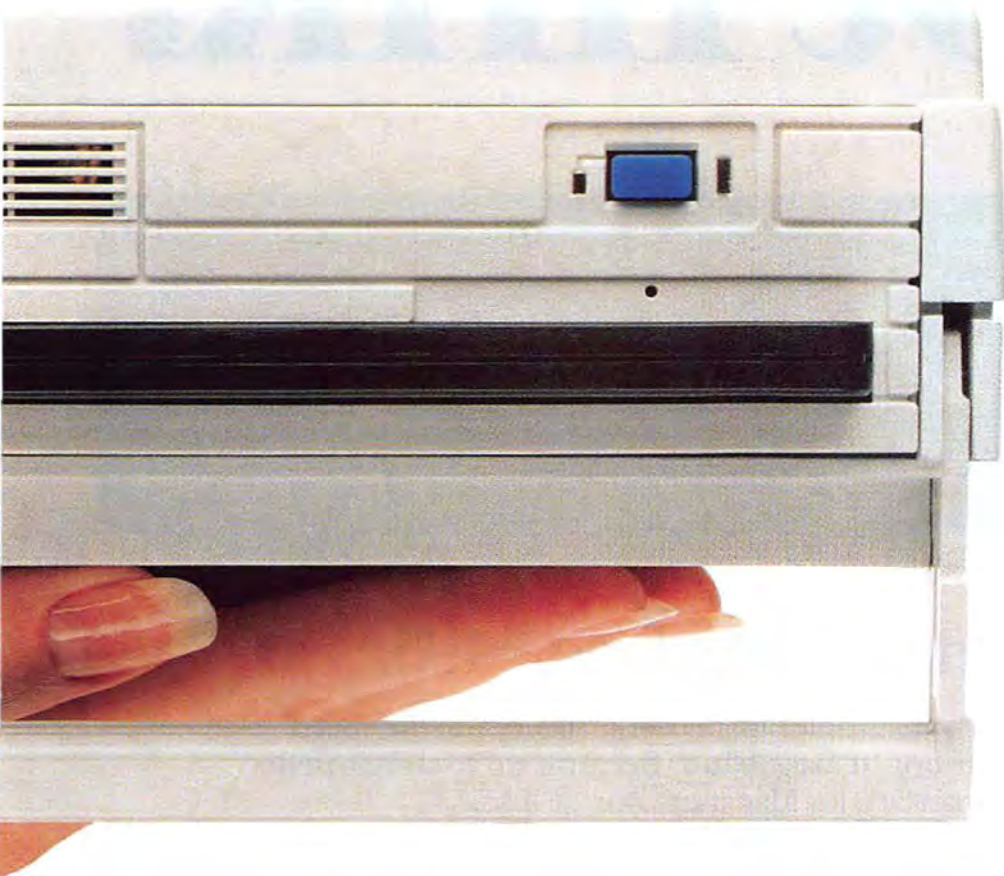
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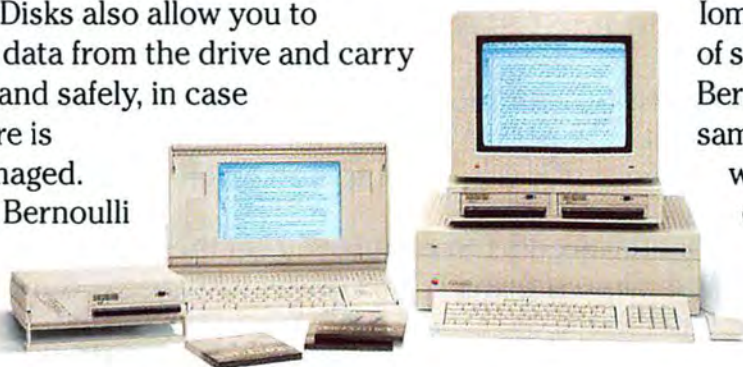
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Eavesdropping with Inter•Poll

Inter•Poll's echo test can help you spot trouble on a shaky network.

People sometimes tell me that their network works fine during off-hours, but as soon as everyone comes to work, they start losing connections with servers and printers. This situation is a great mystery to them. Why should their network work only part of the time?

To unravel this mystery, we must expand our concept of reliability. We normally think of our network's reliability in terms of whether it works or does what we want it to do. If we want to print a document, the network works if the document appears in the LaserWriter output tray, and it doesn't work if the document doesn't appear. Between *works* and *doesn't work*, however, is a lot of gray area that I call *shaky*.

What does *shaky* mean? First let me provide some background. If you want to print a document or access a file on a server, many data packets must be successfully sent over the

network. If your network is shaky, some packets will arrive intact and some will be garbled. In most cases, your Mac will figure out when the data in a packet is corrupt, and it will either request or wait for the distant device to resend the information. You won't see any dialog box or blinking icons — the Mac will handle it all for you, typically in less than a second. However, it will give up after repeated tries if it doesn't receive the required information correctly.

When a network isn't busy, it's easy for a device to resend a bad packet before the receiving Mac gives up waiting for it. But the busier a LocalTalk network gets, the harder it is for any one device to get

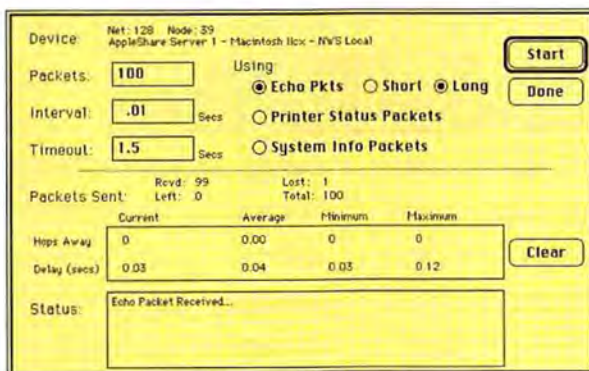
access to it, because all the devices are constantly vying for that access. So it takes longer to resend each packet, and the time it takes to finally get a good packet through may exceed your Mac's staying power. When this happens, you can lose your connection to AppleShare or the LaserWriter. A dialog box, at best, or a crash, at worst, informs you of the bad news.

In short, connections that seem solid when the network *is not* busy may appear shaky when it *is* busy.

Luckily, shakiness is something that can be diagnosed with Inter•Poll, the \$129 network-management utility from Apple. Inter•Poll has many great features, including an *echo test*, which

can determine the reliability of a point-to-point connection between two AppleTalk devices, such as a Mac and a server. In an echo test, the Mac running Inter•Poll sends a data packet to a distant Mac that has an INIT called Responder installed in its System Folder. (Responder comes on the same disk as Inter•Poll.) The receiving Mac sends a duplicate of the packet back to the originating Mac. Inter•Poll sends out several echo packets — you can tell it how many to send — and counts how many of them come back. (Inter•Poll can also send status-request packets to printers, which respond with printer-status packets.)

If you send 100 packets out and only 97 come back, you've learned something about the network's reliability between your Mac and the distant device. Inter•Poll also keeps track of the average and maximum times for packets' round-trips, which gives



	Current	Average	Minimum	Maximum
Packets Sent	99	0	0	0
Hops Away	0	0.00	0	0
Delay (secs)	0.03	0.04	0.03	0.12

Figure 1: Inter•Poll's echo test can help you spot trouble in a shaky network. You specify how many data packets to send to a distant Mac and at what interval; it counts how many packets are echoed back and how long the round-trip takes. If you send 100 packets out and only 97 come back, your network may have a problem.

By Kurt VanderSluis

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POWER TOOLS


you an idea of how busy the network is.

To run an echo test, open Inter-Poll and choose Network Search from the Options menu. Click on the Start button, and you'll be shown a list of available devices. Pick one of the Macs, and select Test Device from the Special menu. In the dialog box that pops up, specify 100 long echo packets with a delay time of .01 seconds. Press Go, and wait for the results (see Figure 1).

In a perfect network, all 100 packets will be echoed back to you, with an average delay of .02 seconds and a maximum

An echo test can determine the reliability of a connection between two AppleTalk devices.

delay of perhaps .04 seconds. If the network is busy, the average delay will be longer, perhaps .04 to .06 seconds, with maximum times of around .12 seconds. In a broken network, you won't even be able to test the distant device, because it won't appear in the device list. In a shaky network, most of the packets will get through, but you'll lose some of them. How many you lose depends on how shaky your network is. If the number received is 98 or 99, you should probably repeat the test a few times. If the number is consistently less than 98, you should investigate. If the number is less than 95, you definitely have a problem.

Once you know there's a problem, you can isolate it by running the echo test with other nodes around the network. If, for example, all the nodes on a particular branch of the network appear shaky, that branch may be too long or it may be improperly terminated. Or better yet, you can follow Rule No. 1 of troubleshooting, established in the first installment of Trouble Shots (April '89): Know how everything is supposed to look. Test your network when it's healthy; don't wait until trouble appears. If you run the echo test, say, any time you add a new node to the network, you may be able to identify a problem *before* it affects users. 



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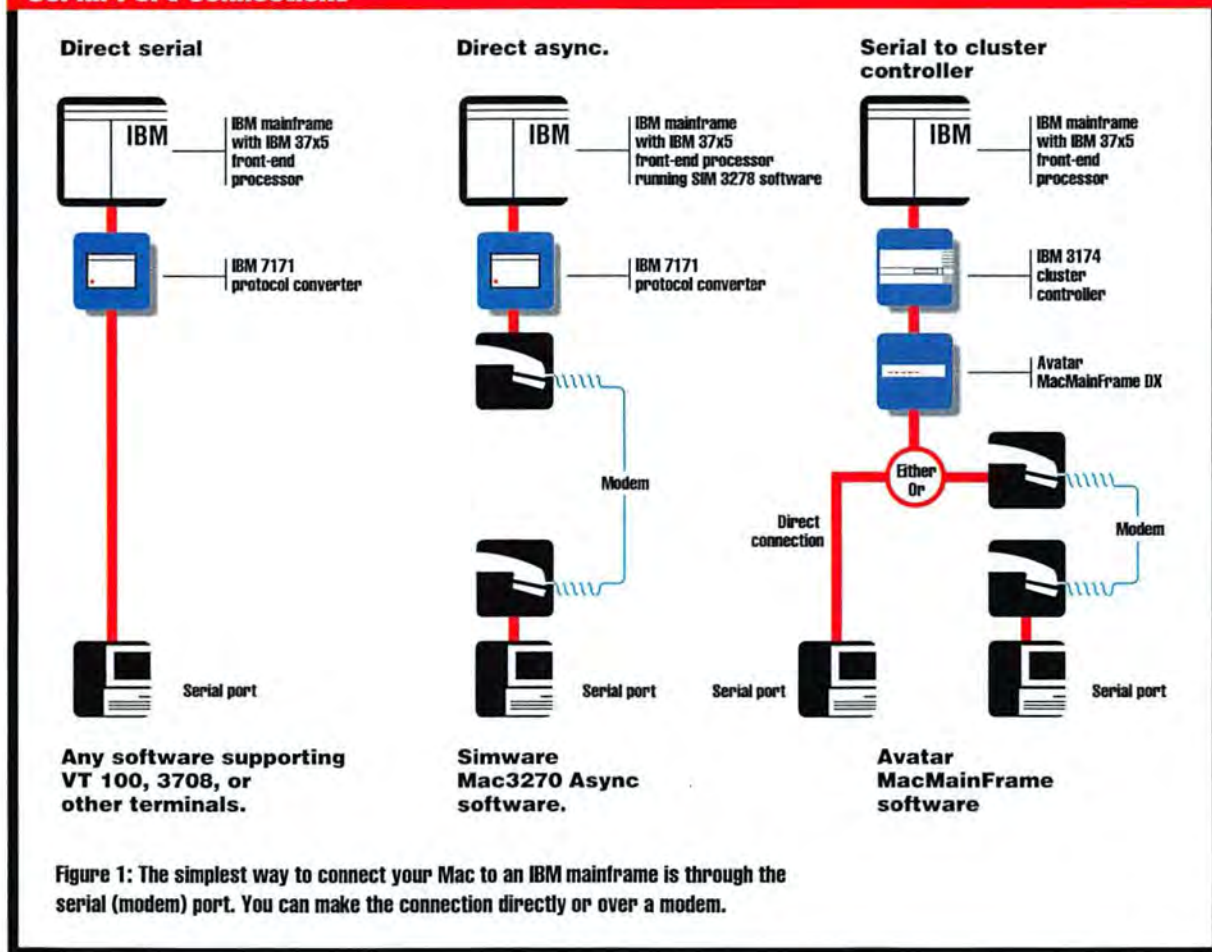
Understanding the intricacies of IBM's mainframe network strategy is usually the domain of MIS (management information systems) gurus, so connecting a Mac to an IBM mainframe cannot be taken lightly. The task can be confusing, but once your Mac is connected, you have the resources of a mainframe available

at a mouse click. For those of you who are not gurus but still need the power, here's a guide to the options for talking to Big Blue machines.

There are two pieces to this connectivity puzzle. The first is terminal-emulation software. Unlike PCs or Macs, the display terminals hooked up to mainframes are "dumb" — that is, they lack processing power, kind of like TVs with keyboards. To communicate effectively with a mainframe, your Mac must imitate a display terminal. Emulation software translates the data moving into the Mac so that your screen looks like a standard

By Ernest H. Mariette

Serial-Port Connections



terminal screen. Data going back to the host (the mainframe) is translated into IBM format. The most common IBM terminals are the 3270 series, so this article focuses on software packages that emulate 3270 terminals.

The second piece you'll need is a hardware connection to IBM's Systems Network Architecture (SNA), the standard for IBM mainframe networks. There are three options for fitting your Mac into SNA connectivity schemes. The first possibility uses the Mac's serial port to make the connection through direct wiring or via a modem. On the mainframe side, this connection is made either to a protocol converter such as an IBM 7171, which translates the Mac's ASCII characters into the EBCDIC used on the mainframe, or to a third-party box plugged into an IBM 3174 cluster controller, which is a device that routes data between a mainframe and several terminals. A second option is to connect to SNA through LocalTalk, Ethernet, or

token-ring networks. Finally, a coaxial cable can link your Mac directly to a cluster controller.

Which method do you choose? The answer depends on the mainframe-to-PC standards your company has already established. For instance, if your office has a token-ring network, you'll have to install a token-ring card in your Mac. If you have local cluster controllers, a coax card is the way to go. Let's take a closer look at the three ways to connect your Mac to SNA and then examine the features of 3270-emulation software.

Serial-Port Connection

The simplest mainframe connection starts at the Mac's serial (modem) port. You can plug directly from this port into the mainframe if it's nearby, or you can use a modem to access it remotely (see Figure 1).

If you want to communicate via the serial port, there are several terminal-emulation packages that will do the trick.

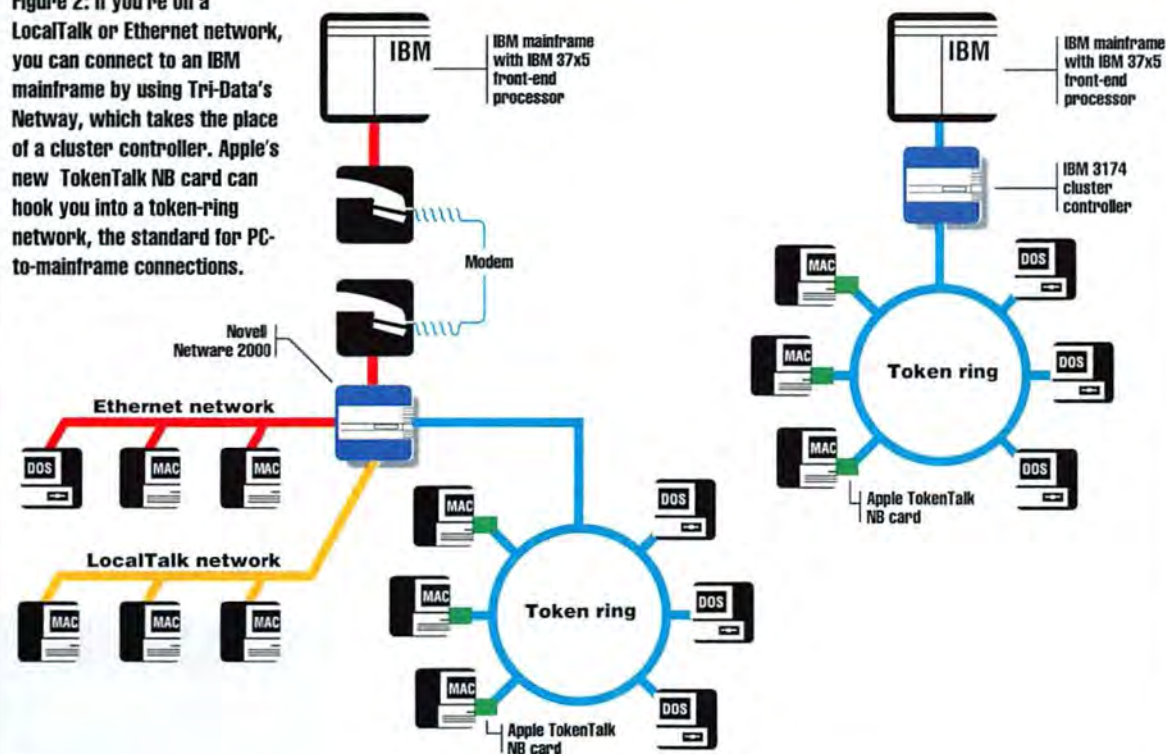
MicroPhone II, VersaTerm-PRO, DynaComm, and Mac3270 Async can emulate terminals such as the VT100 or the IBM 3708, among others (see "Custom Calling," August '89). For 3270 emulation, however, you have only two choices: Simware's Mac3270 Async and Avatar's MacMainFrame DX. At press time, these were also the only serial-port 3270 solutions available for the Mac Portable.

Mac3270 Async, which connects your Mac to the mainframe by way of a protocol converter, costs a mere \$250. Unfortunately, the host mainframe must be fitted with SIM3278, a software package that costs between \$10,000 and \$20,000, depending on the mainframe configuration. Overall, Mac3270 Async works well, but it has some minor bugs when it's used with the Mac IIcx that prevent Mac keyboard commands such as Command-C from working. Simware is aware of the problems and plans to fix them in its next upgrade, due out by the end of 1989.

Avatar's MacMainFrame DX hooks

The Network Connection

Figure 2: If you're on a LocalTalk or Ethernet network, you can connect to an IBM mainframe by using Tri-Data's Netway, which takes the place of a cluster controller. Apple's new TokenTalk NB card can hook you into a token-ring network, the standard for PC-to-mainframe connections.





Of course there are other ways to connect an IBM mainframe to Macintosh.

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into a cluster controller instead of a protocol converter. This solution is substantially cheaper; the \$1,195 price includes both the Mac software and the hardware required for the mainframe.

Network Gateways

You can also link your Mac to a mainframe through a LocalTalk or Ethernet network or by adding it to a token-ring network, which is IBM's method for connecting PCs and mainframes (see Figure 2).

LocalTalk and Ethernet networks can be connected to an IBM mainframe by using Tri-Data's Netway, the most popular Macintosh-to-mainframe solution. Netway packages include both the gateway hardware and Macintosh software. The Netway 1000 (\$3,995) connects a LocalTalk network of up to 16 users; the Netway 2000 (\$9,995) supports up to 64 users on LocalTalk, Ethernet, and token-ring networks.

Netway's principal advantage is its low cost per connection because it replaces the need for a coax or token-ring card in each Mac. Netway also functions as a 3174 cluster controller on an SNA network, which saves the cost of buying one. The trade-off is speed, especially when transferring files. Netway uses a modem to connect to the mainframe, and its top speed is 56 Kbps (kilobytes per

second), which is less than one-fourth the speed of LocalTalk. This can be a bottleneck to throughput, driving up on-line costs.

If your office uses a token-ring network for PC-to-mainframe connectivity, you can now attach your Mac directly to it. Apple's recently introduced TokenTalk NB Card (\$1,250) makes the physical connection, and its MacDFT software (\$245) can access the mainframe. However, installation of a token-ring node is not plug and play; it requires a system administrator for proper setup.

The Coax Connection

The third approach to making the mainframe connection is through an add-on card that connects directly to an SNA network through category "A" coaxial cable (see Figure 3). This solution usually costs more than \$1,000 per Macintosh, but it offers a fast, secure connection.

There are three main players marketing coax boards for the Mac, all of which

Coax Cards

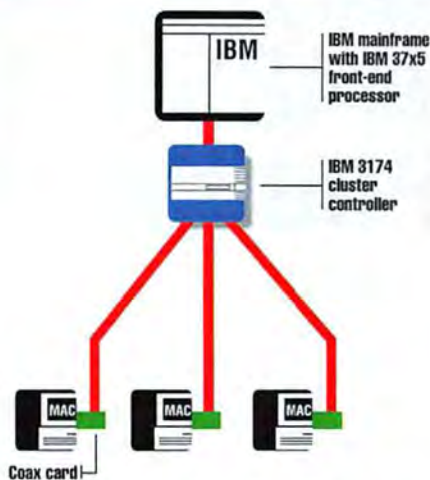


Figure 3: Coax cards are expensive, but they offer fast, secure connections to IBM mainframes.

include 3270-emulation software: Apple (Coax/Twinax Card with MacDFT software), Avatar (MacMainFrame hardware and software), and Digital Communications Associates (DCA—MacIrma board and software). DCA's board also runs Mac3270 Master, a coax version of Simware's Mac3270 Async. (A fourth

Table 1: Terminal-Emulation Features

	Apple MacDFT	Avatar MacMainFrame	DCA MacIrma	Simware Mac3270	Tri-Data Netway
General features					
Emulates 3278, 3279 terminals	✓	✓	✓	✓*	✓
Emulates 3179G, 3192G terminals		†	✓§		
CUT Mode	✓	✓	✓	✓	✓
DFT Mode	✓	✓			✓
Extended Attribute Byte (EAB) support	✓	✓	✓	✓	✓
MacWorkStation support	✓	✓	✓		
Mouse can simulate a light pen	✓	✓	✓		✓
Cursor positioning with mouse	✓	✓	✓	✓	✓
Supports full Mac II color	✓	✓	✓	✓	✓
Macs supported					
Mac Plus		✓		✓	✓
Mac SE, SE/30		✓	✓	✓	✓
Mac II family	✓	✓	✓	✓	✓
Mac Portable		✓ ⁰		✓	✓

* Model 2 only.

† An upgrade will add this emulation by late 1989.

§ MacIrma Graphics (\$195) adds this capability.

⁰ MacMainFrame DX version only.

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player, Novell, is reworking its MacPCox board and distributing it in limited quantities only, so it isn't included here.)

How do you choose a coax board? First determine which companies make products for your Mac (see Table 1). If you're looking for a one-company solution, only Avatar covers the full Macintosh line. It offers MacMainFrame boards and software for the SE, SE/30, and Mac II family; MacMainFrame DX provides dial-in capabilities for the Portable and allows any Macintosh from a 512KE on up to connect to a cluster controller. DCA supports all machines down to the SE level. Apple offers the slimmest choice; its Coax/Twinax NuBus card works only with the Mac II line.

All three vendors make reliable hardware that does the job. Apple's card stands out slightly because it contains a 68000 chip that can execute communications protocols itself, which frees the Mac for other processing. But the only difference users might see between the cards is better MultiFinder performance with Apple's card. Otherwise, it's the terminal-emulation software that differentiates the coax packages, so make your buying decision based on a package that offers the functionality you need daily.

Terminal Types

Terminal-emulation software on the Mac displays a window with contents that look exactly like a mainframe session on a 3270 terminal. The windows are pretty plain, but there are a dozen or so key software features. You probably won't need all of them, but some will be crucial to your particular task.

In the IBM world, the standard 3270 terminal operates in control-unit terminal (CUT) mode, which means that the terminal is a basic one-session dumb screen and keyboard. All the Mac emulation packages work in CUT mode. The next step up is the distributed-function terminal (DFT) mode, in which some of the functions of the cluster controller are performed on the terminal. This gives the Mac the ability to maintain up to five simultaneous sessions with the mainframe — that is, you can have up to five windows on your Mac, each accessing a different mainframe application.

Avatar's MacMainFrame was the only coax package offering DFT functionality at press time (see Figure 4). Its DFT implementation follows Mac interface guidelines very well and is quite elegant.



Figure 4: In DFT mode, Avatar's MacMainFrame can easily handle four simultaneous sessions with a mainframe. A tear-off keypad contains standard mainframe commands. Clicking on one of the numbers at the right edge of the DFT:1 window changes the font size (and thus the window size).

Apple's MacDFT software first shipped with only the CUT-mode emulator running, but it should be upgraded to full DFT support by now. If you're part of a network, Tri-Data's Netway software also works in DFT mode, providing this capability to all Macs on the network.

Popular 3270 terminals include the monochrome 3278 models 2, 3, 4, and 5, and the color 3279 models 2 and 3. These are all supported by every vendor except Simware, which supports only the model 2s. All vendors support Apple's Color Picker for defining on-screen color, but only DCA offers add-on software (MacIrma Graphics, \$195) to emulate a 3179G or 3192G APA graphics terminal. (Avatar planned to have this capability by the end of 1989.) With MacIrma Graphics, you can use the Mac to display output from the SAS/Graph and Tellgraf mainframe programs as long as your mainframe has IBM's GDDM (version 2.1.1 or newer) and PCLK/F graphics system software.

Perhaps the most frustrating thing about working on a mainframe with a PC is keyboard mapping. Everyone has a different idea about where the Enter key should be. Having a friendly interface for mapping the keyboard is more than useful—it's essential. The software vendors

provide icon-driven windows for dragging the various terminal functions to a picture of the keyboard's current map. Apple's MacDFT has the clearest representation of the keyboard and is the easiest to use. You simply drag a terminal function to the key you want to perform that function. MacDFT uses the familiar trash-can metaphor to clear a key for reassignment, whereas MacMainFrame and MacIrma require you to use an eraser tool to clear a key before reassigning it.

If you're used to working on an IBM terminal or a PC, you'll appreciate the floating keypad that the software packages provide for the Mac. It contains terminal-specific keys such as function keys, PA1, PA2, and Clear. In MacIrma and MacDFT, this keypad is a tear-off menu. At press time, the MacMainFrame keypad was a tear-off only in the DFT version (see Figure 4), but Avatar was planning to include it in an upgraded CUT version. Tri-Data uses a pop-up keypad in its Netway software.

MacDFT and MacIrma let you lock your terminal-emulation settings with a password. This feature doesn't prevent other users from having their own settings files, but it does solve the problem of someone changing the keyboard map that you prefer.

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Mainframes for the Rest of Us

Mac users expect certain features (major and minor) in all their software, and 3270 emulation is no exception. The emulation packages can cut and paste a terminal image. They also can do an "intelligent" copy that puts tabs in the place of spaces on-screen — useful for cutting from the screen and pasting directly into a Mac spreadsheet. The selection area can be the normal line-by-line type or block mode. MacMainFrame's implementation is a bit more automatic because it assumes that if there are two spaces, they should be replaced by a tab. MacIrma requires that you specify the number of spaces that should be replaced by a tab.

Control over font size is another feature all the products support. Since a 3270 session window can be only 80 or 132 characters wide (depending on the terminal), changing the font size resizes the terminal window. MacMainFrame's DFT versions offer a handy on-screen option that has font sizes listed at the right of the window. Click on the size you want, and the window is resized.

The packages also provide a special font to display characters particular to the IBM mainframe environment. My favorite is MacMainFrame's Armonk font. (Armonk, New York, is to IBM what Cupertino, California, is to Apple.) The MacDFT font is a close second, while the MacIrma A and B fonts are not as nice.

Mac programmers will appreciate the application-program interfaces (APIs) each product offers. APIs let you create front ends for mainframe programs and are useful for automating file transfers, masking complex procedures such as log-on, and creating Mac-like interfaces to mainframe programs. All the vendors provide APIs, but DCA is the leader. (APIs will be covered in more depth in a future Bridges article.)

File Transfer

Moving files between a Mac and mainframe is much simpler than the methods used on DOS machines. All the vendors take full advantage of the Mac interface to provide built-in menus for file transfer. This sure beats looking up the procedure in a manual and typing it at the command line!

In addition to proprietary formats, all the products support IBM's standard IND\$FILE protocol, and MacIrma also supports IrmaLink and ForteNet formats.

MacMainFrame has a batch-transfer mode, which can operate in the background under MultiFinder.

Apple's MacDFT can record a session's keystrokes for playback using a macro language. This feature is quite useful for automating log-on sequences

and is a big plus for Apple.

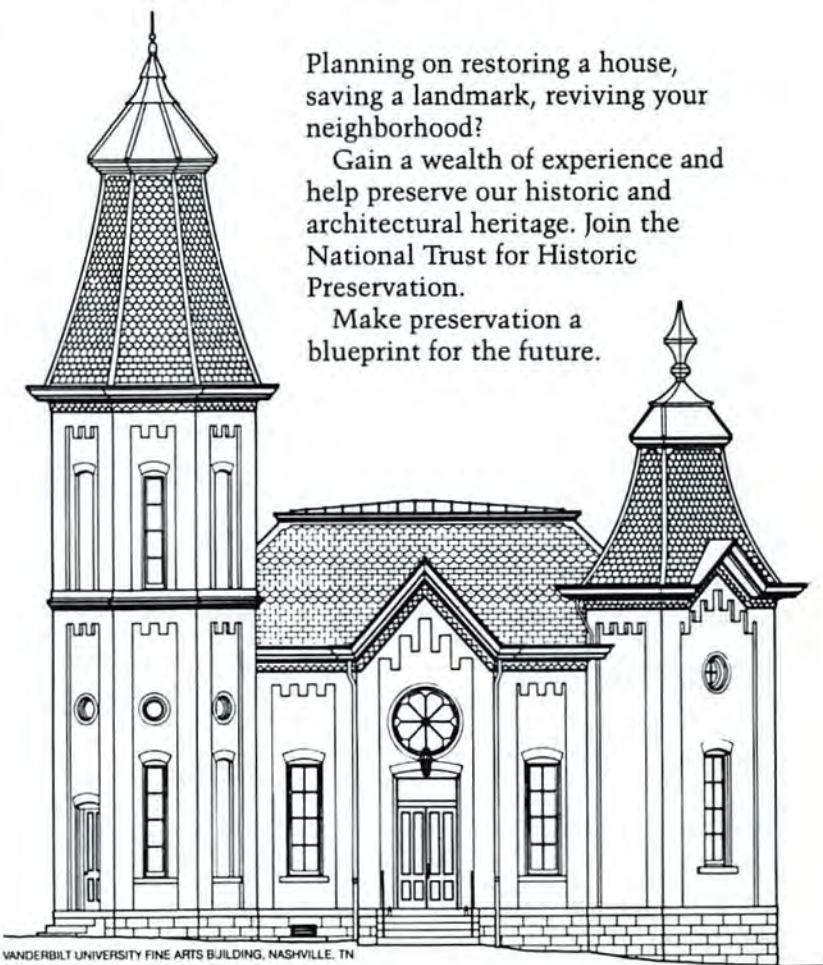
Even more impressive is the scripting language that comes with Simware's Mac3270. Its 120 commands and functions can automate repetitive processes such as log-on and log-off, network navigation, and file transfer. A script can be

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POWER TOOLS

compiled as an external script to be called when needed, or it can be stored as an internal script, part of the Session document created by Mac3270 to save user settings. You can assign a script to a key, using the keyboard-mapping feature. Double-clicking on a key opens the Key Script dialog box, which allows shorter scripts of up to 250 characters to be written for the selected key.

If that isn't enough to make you smile, consider this: With only a few exceptions, the Mac3270 script commands and functions are the same as those in SIMPC, Mac3270's sister program that runs on IBM PCs. This means that a single mainframe front end for both Macs and PCs can be developed and distributed on a companywide basis.

Conclusion

The obstacles that once prevented the Mac from working in an IBM environment no longer exist, thanks to advances in terminal-emulation software and the availability of coaxial and token-ring cards and gateways.

If you have more than a handful of Macs, Tri-Data's Netway is the most cost-effective connection to SNA. For users on the road, a serial connection to the mainframe via modem gives you access from anywhere. Simware's Mac3270 Async is an inexpensive solution only if you already have the mainframe software. Otherwise, the low-cost serial solution is Avatar's MacMainFrame DX, which has more features than does Mac3270 Async.

If performance is your main concern, however, a coax card is your best bet. After working with all the coax products over several weeks, I was drawn to the look and feel of Avatar's MacMainFrame DFT. It has more functionality and the most complete set of features. You really can't go wrong with any of the boards, and you might need some of MacIrma's

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terminals, but overall, Avatar's MacMainFrame DFT is the price/performance leader among coax cards. ☐

Ernest H. Mariette is principal consultant for Mariette Systems International, which solves Macintosh-to-IBM connectivity problems for Fortune 1000 companies. Randy Killen of 4GL Consulting provided the review of Simware products.





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Caché Systems 150/150 Tape 16ms	\$2,499.	\$2,159.
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Caché Systems 60 28ms	\$639.	\$499.
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Quantum 80 19ms (2 Yr. Warranty)	\$889.	\$699.

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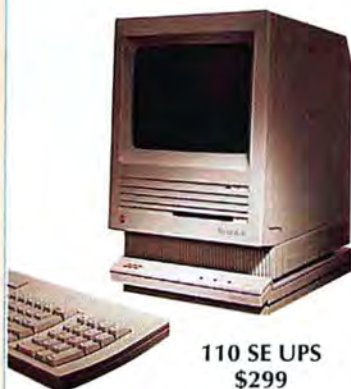
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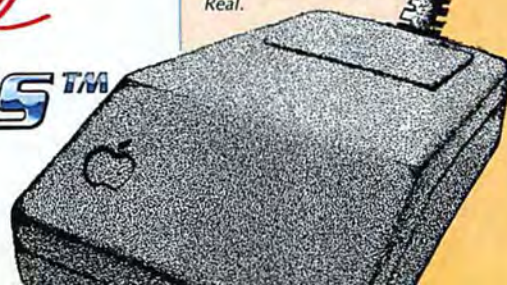
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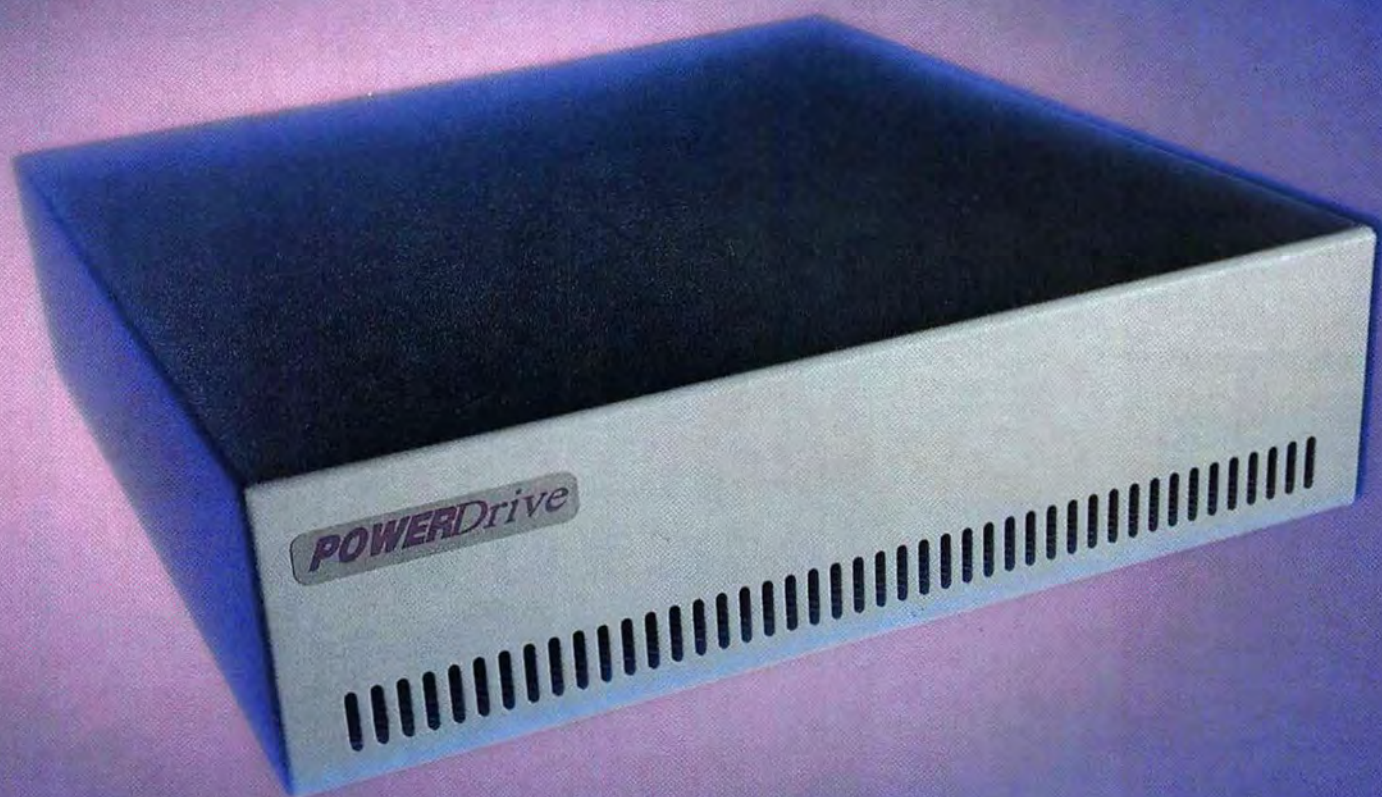
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RS#	ADVERTISER	PAGE	RS#	ADVERTISER	PAGE
17	Abbott Systems	10	121	Mac-In-Stock	202
9	Absolute Solutions	230	50	MacLand	270-271
N/A	Adobe	122-123	29	MacProducts USA	280-281
198	Aldus	114-115	165	MacStore	259
71	ALSoft, Inc.	156	34	MacWarehouse	147-155
159	Altsys Corporation	195	N/A	MacZone	184-191
10	Aperture	78	13	Mainstay	173
64	Applied Engineering	177	186	MathSoft	226
80	Atasi Technology	76	33	Maxcess	220
162	Autodesk Inc.	200-201	51	Merritt Computer	229
163	Avatar	262	81	Micron Technology	68
190	Buick	169	182	Micronet	141
49	CalComp	134-135	183	Micronet	143
189	Cambridge North America	167	N/A	Microsoft	C2-C4, 1
147	Computer Associates/Cricket	132	N/A	Microsoft	208-209
117	CDA Computer Sales	178-179	N/A	Microsoft	92-93
21	Central Point Software	24	N/A	Microsoft	248-249
119	Compuserve	174	134	Microtech International	128
118	Compuserve	175	31	Microtek Labs	130
32	Computer Friends	266	83	Mirror Technologies	242-243
28	Custom Applications	244	195	Mitsubishi	211
193	Data Viz	126	157	NEC Home Electronics	20-21
82	Deneba Software	7	102	Nuvotech	256
76	Deneba Software	72-73	131	Odesta	198
120	Diskette Connection	221	N/A	Oracle	11
169	Dr. Mac	144-145	14	Orange Micro	25
110	Dubl Click	6	20	Orange Micro	94
77	Ehman Engineering	C5	39	Pairs Software	24
78	Ehman Engineering	C6	90	Paracomp	109
79	Ehman Engineering	C7	107	Paragon	235
91	Ehman Engineering	C8	48	Peripheral Land	222-223
16	Emerald City Software	124-125	68	Personal Training	85
N/A	Farallon	238-239	30	Pinnacle Micro	234
24	FWB Software	233	72	Programs Plus	96-103
97	GCC Technologies	87	188	Prometheus Products	246
104	GCC Technologies	89	178	Qume	224
116	GCC Technologies	91	179	Qume	224
42	Hard Drives International	274-275	141	Radius	12-13
18	Hewlett Packard	159-161	N/A	RasterOps	165
27	HJC Software	14	35	Reasonable Solutions	136
N/A	Image Club	106	12	S.P.S.S., Inc.	138
197	Informix	216-217	150	Safeware	241
111	Infosphere	266	160	Sharp Electronics	176
N/A	Intuit	65	N/A	Shiva	258
43	Iomega	254-255	26	Sigma	16
113	IPT	15	99	Softview	80
114	IPT	170-171	154	Software that Fits	272-273
60	Jasmine	66-67	127	Specialty Software	214
62	JDR Microdevices	232	19	Summus Computer Systems	70
63	JDR Microdevices	232	41	Supra Corporation	207
152	Kensington	118	38	SEIKO	111
94	Kinetics/Novell	22	171	Tektronix	212
96	Letraset	229	23	T/Maker	19
88	Liberty Systems	259	122	Teknosys	285
89	Linotype	228	8	Teleware	82
N/A	MacConnection	26-59	196	Thunderware	18
84	MacFriends	120	123	Timeworks	117
85	MacFriends	121	N/A	TOPS	9
86	MacFriends	157	11	TreeStar	220
87	MacFriends	203			

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51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
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☐ b) Mac SE ☐ e) Other
☐ c) Mac II

2. For how many micro computers do you buy products?

- ☐ f) 1-4
☐ g) 5-49
☐ h) 50+

3. Your primary job function is:
(check one)

- ☐ i) Administrative/General Management
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☐ k) Engineering/R&D
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(Check all that apply)

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5. Are you involved in the purchasing of microcomputer equipment at your company?
☐ 5) Yes ☐ 6) No

6. If so, what function do you serve in the buying process?
☐ 7) Evaluations/Specification
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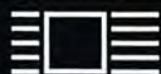
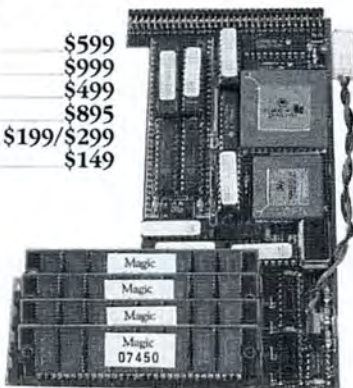
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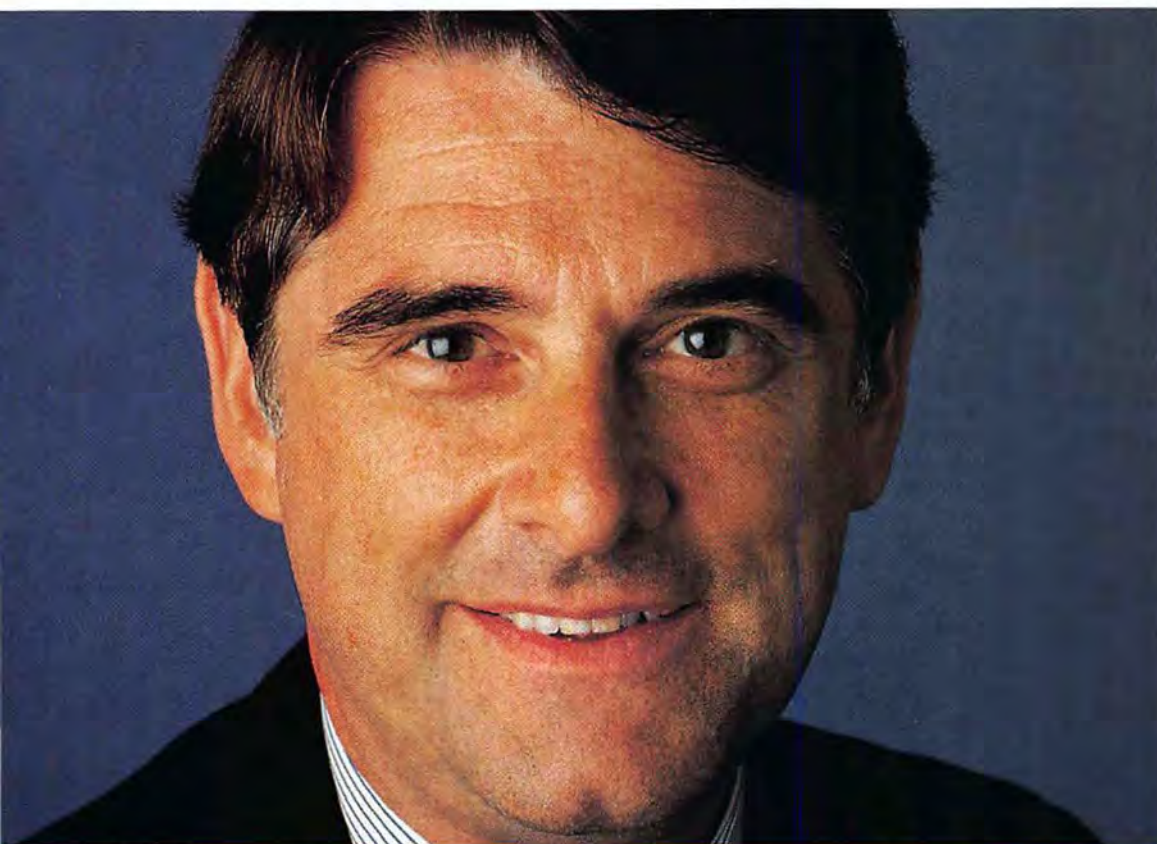
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HARDWARE 287-293

BAR CODE	287
COMPUTER SYSTEMS	287-288
DATA ACQUISITION	288
DISKETTES	288-289
DISK DRIVES	289
ENGINEERING	289
GENERAL	289
INSURANCE	289
MEMORY UPGRADES	290-292
PERIPHERALS	292-293
PRINTERS	293
SCANNERS	293
SECURITY	293

SOFTWARE 293-299

ACCOUNTING	293
BACK-UP	293
BAR CODE	294
BUSINESS	294
BUSINESS TIME MANAGEMENT	294
CD-ROM	294
DESKTOP PUBLISHING	295
EDUCATIONAL	295
EMULATION	295
ENGINEERING	295-296
ENTERTAINMENT/GAMES	296
FONTS	296
FUND RAISING	296
GENEALOGY	296
GENERAL	297
GRAPHICS	297
LANGUAGE TOOLS	297
MENTAL ARTS	297
MUSIC/MIDI	297-298
PUBLIC DOMAIN	298
RELIGION	298
SCIENTIFIC	299
SHAREWARE	299
STACKWARE	299
STATISTICS	299
TAXES	299

MISCELLANEOUS 299-301

ACCESSORIES	299-300
BOOKS/CATALOGUES/PUBLICATIONS	300
BUSINESS OPPORTUNITIES	300
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SUPPLIES	301

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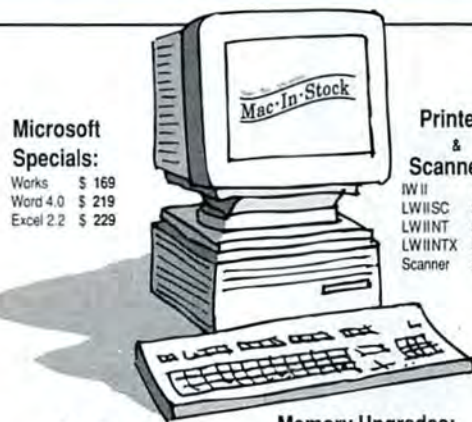
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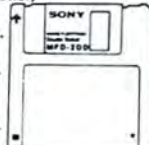
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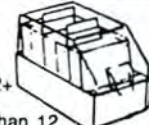


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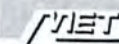
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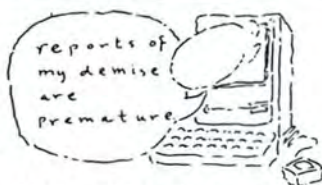
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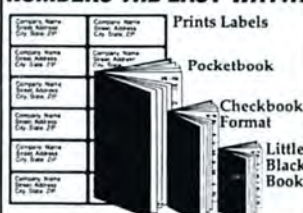
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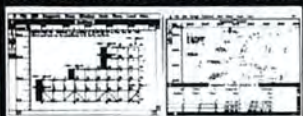
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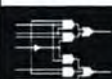
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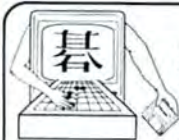
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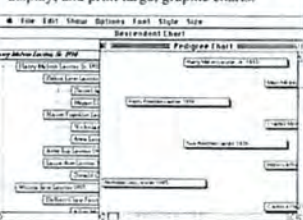
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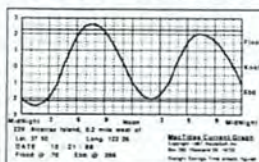
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JOHN C.

DVORAK



It was the Seybold Desktop Publishing shindig in San Francisco. At the podium, Bill Gates revealed his plan to join forces with Apple to produce a new font outline standard to supplant PostScript. It would obviously be based on PostScript itself, or at least on a clone, since Microsoft had just bought Bauer Enterprises, producer of a PostScript clone.

Apple would use this clone, thus saving on royalties to Adobe. In turn, Apple would turn over to Microsoft a bunch of

of products that were never great to begin with. Upgrades are profit centers. Take Microsoft Word (please!). It must scare the pants off Warnock to see what a great job of marketing Microsoft does with a word processor that is hardly the best.

Fact is, Microsoft has become a superb marketing company, period. So if you can sell well, then sell what brings in the most bang for the buck: a license. Make other people manufacture and produce and even support your product while they pay you for the privilege. The company wants to license DOS, OS/2, XENIX, Windows, and now some sort of PostScript clone. If Apple goes along with the idea, Microsoft will get rich on PostScript. In the process, it will learn enough tricks from Apple to improve OS/2 and have even more licenses to sell!

Well, I still haven't answered the big question: So what's in it for Apple? Of all the computer companies in the world that don't need Microsoft for anything, Apple must be No. 1. Apple has its own operating systems. Most of the programs written for the Mac are done in THINK C or some non-Microsoft language. All Microsoft brings to the party is Excel. A revival of the old Crunch program or even a real Lotus clone would make Excel

The Mysterious Apple-Microsoft Pact

proprietary software that would make it easier for Microsoft to improve the inferior graphical interface it sells to IBM and the world of clones. Does this sound like a good idea to you?

Adobe honcho John Warnock, visibly shaken by an attack on his small firm, then announced that all of Adobe's font-technology secrets would be made public domain.

Obviously Warnock felt that the superior Adobe PostScript technology was too important to the industry to be subordinated by Gates, so he took the peculiar marketing tactic of essentially giving away the razor blades and selling the razors! All the while, the wily Steve Jobs was lurking in the background; he called the Gates maneuver "political." Jobs sees Gates as panicky and fearful of losing his privileged place at the IBM dinner table. Jobs was at the show with a slew of NeXT machines running Display PostScript. Perhaps seeing Jobs in bed with Adobe irked the powers at Apple, who perceive Steve and his peculiar IBM-Ross Perot-Canon axis as a genuine threat, even if he can't sell ten machines. So Apple will make a strange alliance with Microsoft, a company it recently sued over its Windows interface. So much for the lawsuit.

Supposedly this newfound alliance is arranged so the two companies can develop this new font technology together. But I ask you, what has Microsoft ever developed except MS-BASIC, a mouse, and Excel? Everything else it bought from other companies that could do it better. Rather than developing products, Microsoft has become the world's biggest upgrade and maintenance programming house. Even MS-DOS was bought from Seattle Computer Products.


What Microsoft discovered from the MS-DOS purchase and the subsequent deal with IBM was that the big dough is made by finding something to license. To heck with database managers and accounting packages. Let Ashton-Tate and Computer Associates have those markets; they're too much work. Sure Excel, BASIC, and the like make money. But look at the dough you can make with licenses! Besides MS-DOS, what is the big money-maker in the world of licensing? PostScript, that's what.

Another characteristic of Microsoft is its constant upgrading

as expendable as Word on the Mac. Microsoft has no foothold, so why give it one when it feeds the world of the cheap PC power-clone? This, I thought, was the enemy! Whatever edge Apple has will be transferred to the competition in a minute. Apple loses sales while Microsoft, like a neutral arms dealer in a fomented war, profits from both sides of the battle.

I don't see what Apple hopes to gain from this alliance. It could have bought and developed a PostScript clone itself. Perhaps it's a trap of some sort designed to set up Gates for an unusual lawsuit. Maybe it's worth risking the transfer of Apple technology to the world of the PC if you can get deep enough inside Microsoft to discover something for which you can sue the pants off them — and IBM. You know how Apple loves to use the courts to protect its interests.

Apple doesn't want to stop supporting PostScript — that's for sure, since nearly all the high-end typesetters have taken the hint and offer support. There's no way a Microsoft-Bauer PostScript clone will do the job of Adobe's software, either. The Adobe stuff is terrific. But Apple needs some low-end relief so it can sell its \$900 Mac of the future with a cheap laser printer. It can't afford to spend more than a buck per machine for PostScript on a low-end printer. It needed price relief, and obviously Adobe was too slow to move. Also, Adobe's Display PostScript is slow, and its inability to work adequately with color might be part of the problem. I'm sure Microsoft said, "Hey, look how big we are. Together we can lick these problems and own the code too!" If all works out, then Apple gets a cheap (and probably inferior) outline-font technology and Microsoft gets something it can license.

And the beat goes on. 



By JOHN C. DVORAK

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